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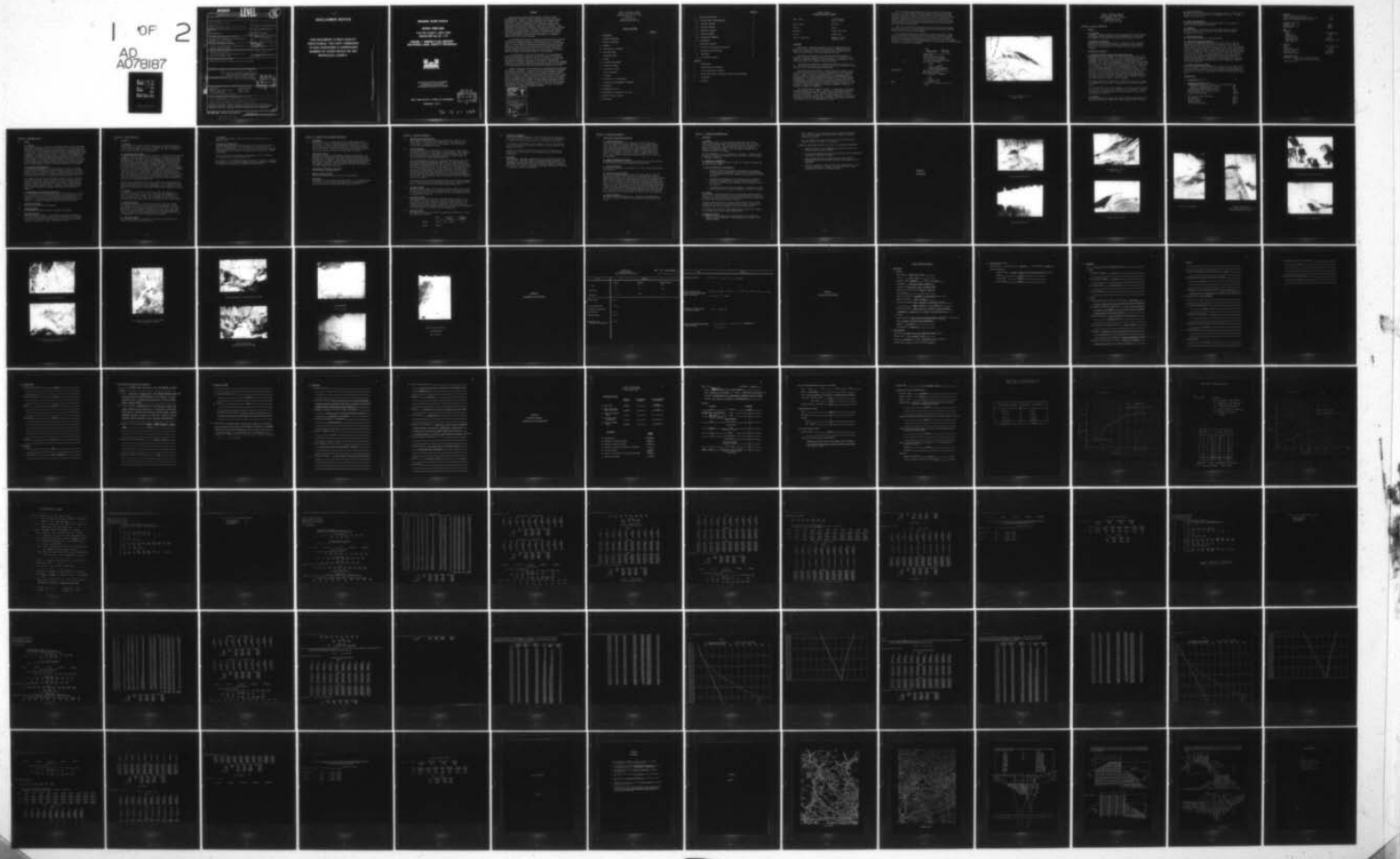


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Irving Pond Dam
Mohawk River Basin, Fulton County, New York
Inventory No. N.Y. 464

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National Dam Safety Program

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Irving Pond Dam
Fulton County
Canada Creek

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)
This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

Irving Pond Dam was judged to be unsafe, non-emergency due to a seriously inadequate spillway. Further investigation including a in-depth hydrologic/ hydraulic study and a spillway stability analysis was also recommended.

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MOHAWK RIVER BASIN

IRVING POND DAM

FULTON COUNTY, NEW YORK
INVENTORY NO. N.Y. 174

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

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CONTRACT NO. DACW-51-79-C0001

NEW YORK DISTRICT CORPS OF ENGINEERS

FEBRUARY, 1979

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probably Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
IRVING POND DAM I.D. No. 174
DEC #476
MOHAWK RIVER BASIN
FULTON COUNTY, NEW YORK

TABLE OF CONTENTS

PHASE 1 REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Irving Pond Dam I.D. No. NY 174
State Located:	New York
County:	Fulton
Watershed:	Mohawk River Basin
Stream:	Canada Creek
Dates of Inspection:	November 1, 1978 March 21, 1979

Cont'd from P. 1-3

ASSESSMENT

Examination of available documents and visual inspections of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, additional studies should be undertaken to further evaluate conditions affecting the dam.

Subsurface investigations of the spillway and its foundation are required to perform a complete stability analysis of the spillway. An additional investigation should also be undertaken to determine the exact nature and cause of the seepage through the spillway.

Investigate the conditions of seepage encountered at the toe of the dam. This investigation must be conducted under no flow conditions so that spillway flows do not mask seepage observations.

Additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed. Using the Corps of Engineer's Screening Criteria for initial review of spillway adequacy, it has been determined that the embankment would be overtopped for all storms exceeding approximately 9% of the PMF (Probable Maximum Flood). A dam break analysis, assuming a complete breaching of the embankment, indicates that water surface levels downstream of the dam could reach levels which would pose significant danger to residents. The spillway is, therefore, adjudged as seriously inadequate and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to loss of life downstream of the dam.

It is, therefore recommended that within 3 months of the date of notification of the owners, the above-mentioned investigations of the structure should be undertaken to determine the appropriate mitigating measures to be taken. Within 18 months of the date of notification, appropriate remedial measures should be completed. In the interim, a detailed emergency operation plan and warning system should be developed and around-the-clock surveillance should be provided during periods of unusually heavy precipitation.

There are several minor deficiencies which require remedial action. The joint between the reservoir drain valve and the outlet pipe should be sealed within 6 months of notification.

The following deficiencies should be corrected immediately. Water flowing through the cracked south end wall should be diverted back over the spillway in order to avoid erosion of the embankment. Vegetative growth on the embankment and along the walls of the reservoir drain should be removed. The reservoir drain system should be periodically and systematically inspected and repaired as necessary.

George Koch

George Koch
Chief, Dam Safety Section
New York State Department
of Environmental Conservation
NY License No. 45937

Approved By:

Clark H. Benn

Col. Clark H. Benn
New York District Engineer

Date:

1 June 79

Overview of Irving Pond Dam
Looking South

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
IRVING POND DAM, I.D. No. NY 174
MOHAWK RIVER BASIN
FULTON COUNTY, NEW YORK

SECTION 1: PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase 1 Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367.

b. Purpose of Inspection

Evaulation of the existing condition of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of the Dam and Appurtenant Structures

The Irving Pond Dam is composed of a 290 feet long stone filled crib embankment covered with riprap. A 59 feet wide concrete slab spillway is located in the center of the structure. Maximum height of the embankment above the old stream bed which is located below the spillway is 23 feet. The crest of the embankment is 24 feet wide, upstream slope is 1 vertical on 2 horizontal and the downstream slope is 1 vertical on 2.25 horizontal. The elevation of the embankment is 1710.0. The top of the south embankment section is totally exposed whereas the north section is heavily riprapped. Slopes are protected by riprap. A sheet pile cut off is located along the upstream face of the dam and the spillway. The top of the sheet pile is exposed from a few inches to more than two feet at different locations of the embankments while it is buried under the concrete in spillway section. The plans indicate that sheet piling was driven to rock or hardpan.

[Cont'd on P. 1-2]

The ungated spillway is constructed of rock-filled timber crib topped by a reinforced concrete slab. The elevation of the spillway crest is 1707.0.

The low-level drain is a 4 feet diameter, 1/4 inch thick steel rivetted pipe, 40 feet long, the flow is controlled by a sluice gate. The gate is connected to a manually-operated control mechanism located on the upstream side of the dam.

b. Location

The Irving Pond Dam is located on Irving Pond outlet approximately one-half mile northeast of highway 29A, Town of Caroga, County of Fulton.

c. Size Classification

The dam is 23 feet high and has an impoundment capacity of 2100 acre-feet. Therefore, the dam is classified as "Intermediate" in size. (Storage 1000 to 50,000 acre-feet).

d. Hazard Classification

The dam is classified as high-hazard dam because of the presence of a number of homes immediately downstream.

e. Ownership

The dam is owned and operated by Niagara Mohawk Power Corporation, 300 Erie Boulevard West, Building D2, Syracuse, New York 13202, Telephone (315) 474-1511.

f. Purpose of the Dam

The dam provides storage for power development.

g. Design and Construction History

The dam and its appurtenant structures were constructed in 1865 and extensively repaired or reconstructed in 1913-14 by Durey Land and Lumber Company, Green Lake, Fulton County, New York. The 4 feet diameter steel drain pipe was installed by Adirondack Power and Light Corporation in 1926. The timber spillway apron was replaced by a reinforced concrete slab with concrete end walls in 1931 by New York Power and Light Corporation, Albany, New York. The steel sheet pile cut off was installed along the line of existing timber sheathing and a new intake well and intake pipe connecting to the existing 4 feet discharge pipe were constructed the same year. Additional fill was placed on the upstream side of the dam and the downstream rock fill was trimmed to a uniform slope at the same time.

h. Normal Operating Procedures

Water can be released from the reservoir either by the low-level drain or over the spillway. However, no water is normally released through the low-level outlet and the release over the spillway is accomplished only when the level of water in the reservoir is above the level of the spillway.

1.3 PERTINENT DATA

a. Drainage Area (sq. mi.)	7.7
b. Discharge at Dam Site (cfs)	
Maximum known flood above spillway: 2· 6 ft.(3/19/36)	750
Spillway at Design Pool (El. 1710.0)	800
Spillway at Maximum Pool (El. 1710.0)	800
Maximum Capacity of low-level outlet	200
Total Discharge, Max. Pool (El. 1710.0)	1,000
Average Daily Discharge	Unknown
c. Elevation (ft. above MSL-Datum)	1710.0
Max. Design Pool	1708.5
Spillway Crest	1707.0
Tailrace Channel	1684.0
Invert low-level Drain	1688.0

d. Reservoir

Length of maximum Pool, miles	0.9
Length of Shoreline (Spillway Crest), miles	2.8
Surface area (Spillway Crest), acres	140.0

e. Storage, (Acre-feet)

Spillway crest	2100.0
Maximum Design Pool	2300.0
Top of Dam	2600.0

f. Dam

Embankment

Type:	Rock Filled Crib
Length (ft.)	230.0
Upstream Slope	2:1
Downstream Slope	2.25:1
Impervious Core	Sheet pile cut off
Crest Width, ft.	24.0

g. Spillway

Type:	Rock Filled Crib
Length, ft.	59.0
Crest Elevation MSL	1707.0
Upstream Channel:	Not Visible
Downstream Channel:	Riprapped

h. Regulating Outlet

Upstream - A sluice gate controls the flow to the 4 feet low-level drain pipe

Downstream - None.

SECTION 2: ENGINEERING DATA

2.1 DESIGN

a. Geology

The Irving Pond Dam is located in the southern portion of the "Adirondack Highlands" physiographic province of New York State. This area has been transected by long northeast-southwest lineaments representing shear zones or major faults. The lineaments frequently control drainage and the shape of land forms. Bedrock in the vicinity of the dam is the metamorphic rock metagabbro. The parent material, gabbro, is a dark colored igneous rock consisting of plagioclase feldspar grains imbedded in a matris of dark green pyroxene. The large adirondack metagabbro bodies occur in the more protected parts of the region. However, bedrock in the area of the dam is an isolated deposit of metagabbro which is smaller and more irregular than the large deposits found in the northern portions of the region.

b. Subsurface Investigations

No subsurface investigation could be located for this dam. Drawings indicate that the structure is founded on bedrock. However, the "Dam Report" filed by E. Christman on May 20, 1919 indicates that the dam is founded on loam and gravel. No other information could be located which would accurately describe the foundation conditions beneath the dam.

The "General Soil Map of New York State" prepared by Cornell University Agriculture Experiment Station indicates that the surficial soils are Charlton, Paxton, and Essex of glacial till origin. These soils are generally stony sands and silts with a trace of clay, having moderate internal drainage characteristics. Boulders are also common in these soils. Depth to bedrock is extremely variable; rock outcrops are numerous.

c. Embankments and Appurtenant Structures

It is not known as to who designed the dam and who constructed it other than the owners of the dam at various times. Five drawings were found in the New York State file for the dam and have been included in Appendix F. The dam and the spillway were constructed of rock-filled timber crib. Timber sheathing was replaced by steel sheet pile.

2.2 CONSTRUCTION RECORDS

No construction records are available.

2.3 OPERATION RECORDS

No maintenance or operation record or manual is available.

2.4 EVALUATION OF DATA

Some of the data presented in this report has been made available by Mr. Robert Levett of Niagara Mohawk Power Corporation. This information has been invaluable in the preparation of this report and appears adequate and reliable for Phase 1 Inspection purposes.

SECTION 3: VISUAL INSPECTION

3.1 FINDINGS

a. General

Visual inspection of the Irving Pond Dam and the surrounding watershed was conducted on November 1, 1978. The weather was clear the temperatures ranged in the thirties. The reservoir level at the time of inspection was 4 inches above the crest of the spillway.

b. Embankments and Abutments

The earth embankment shows no sign of distress. The vertical and horizontal alignment of the crest appears to be good with no visible cracks on the embankment slopes or crest. There is no evidence of sliding, sloughing and depressions. The top of the south embankment is exposed earth while the same on the north embankment is heavily riprapped. Slopes are also protected by heavy riprap. There is considerable growth of vetetation on the upstream side of embankment and there is debris and trees around the walls of the low-level outlet and at both abutments. The two abutment walls have cracked exposing sheet piles. Seepage was observed at different locations at the toe of the spillway. However, the seepage water was clear and there was no evidence that fine materials were being carried away. The spillway and the toe of the dam should be observed under no flow conditions to determine the source of the observed seepage. The seepage could be related to spillway flow since the grouted riprap downstream face also serves to transport spillway flow.

The steel sheet piling which serves as a cut-off wall is exposed approximately 2 feet above the top of the embankment. It is believed that this sheeting was driven to this level intentionally, since no movement of the crest could be discerned. An additional inspection was conducted on March 21, 1979.

c. Spillway

The spillway is constructed of rock-filled timber crib topped by a reinforced concrete slab. There are a number of voids underneath the spillway near the north abutment wall, the biggest one being about 4 feet in diameter and 5 feet deep. Water flowing over the spillway was seeping through the stones and coming out through the toe of the spillway.

d. Regulating Outlet

The low-level drain pipe is distorted and rusted. The joint between valve section and the pipe has been displaced approximately 1/2 inch. Some seepage was noticed at this junction. The distortion of the pipe is probably due to the placement of heavy stones on top of the pipe. The flow to the low-level drain is controlled by a sluice gate connected to a manually operated control mechanism placed on the upstream side of the south embankment. The control mechanism is operational.

e. Downstream Channel

The downstream channel is riprapped and no debris was observed in the channel other than some displaced stone.

f. Reservoir

There are no noticeable signs of land slides or instability in the reservoir area.

3.2 EVALUATION OF OBSERVATIONS

Although deficiencies were observed, there are no indications that the dam is in imminent danger. Some deficiencies are minor and may be corrected by maintenance forces. The more serious deficiencies represent conditions which have potential for deterioration and should be further investigated.

The most significant observation is the presence of voids underneath the spillway near the north abutment wall.

The spillway is not considered unsafe at this time. However, a thorough investigation of the spillway foundation should be conducted to determine the extent of the voids and the stability of the spillway.

SECTION 4: OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The Irving Pond is a storage reservoir for Niagara Mohawk Power Corporation. There is no minimum required water release at the dam and no water is usually released downstream. However, up to 200 cfs of water can be discharged through the 4 feet diameter low-level outlet if necessary. The rate of flow through the pipe is set by a sluice gate with controls at the upstream side of the dam.

4.2 MAINTENANCE OF DAM

There is no operation and maintenance manual for the project. The embankment is in good shape. The broad crested reinforced concrete spillway slab is broken in many places; separation of spillway slab and sheet pile is complete. Both abutment walls cracked open exposing sheet piles. There are a number of voids underneath the spillway. The biggest one (about 4 feet in diameter and 5 feet deep) being near the north abutment wall (end wall).

4.3 MAINTENANCE OF OPERATING FACILITIES

The sluice gate is operational.

4.4 WARNING SYSTEM IN EFFECT

There is no warning system in effect or in preparation.

4.5 EVALUATION

The spillway is in poor shape and needs repairs. It is possible that the timber crib has deteriorated, resulting in the displacement of stones and creation of voids underneath the spillway slab.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Irving Pond flows into Canada Lake which inturn flows into East Canada Creek, a tributary of the Mohawk River. The drainage area at the dam is 7.7 square miles. The topography is characterized by steep slopes interspersed by swamps.

5.2 ANALYSIS CRITERIA

For the purpose of this investigation, the dam and the spillway were analyzed with respect to their flood control potential. This potential was assessed through the development of Probable Maximum Flood (PMF) for the watershed and the subsequent routing of the PMF through the reservoir using the computer program HEC-1 DB.

The unit hydrograph was defined by the Snyder Coefficients, Tp and Cp. The Probable Maximum Precipitation (PMP) was 19.3 inches (Figure 1), Hydrometerological Report (HMR #33) for a 24 hour duration, 200 square mile basin. The percentages of the PMP applied to other duration storms were interpolated from the plot of drainage area versus percent of the 24 hour, 200 square mile depth (Figure 2, HMR #33). The PMF inflow hydrograph was determined by applying the PMP to the unit hydrograph for the basin and the peak inflow was 9,900 cfs. After routing the peak inflow through the impounded storage, the peak outflow was determined to be 9,400 cfs. Half of PMF peak inflow was 5,000 cfs and the routed peak outflow was 4,400 cfs.

A dam break analysis was also performed using the same computer program and the results indicate a maximum outflow of 12,500 cfs and 12,600 cfs due to 1/2 PMF and PMF while the inflows remain same as above.

5.3 SPILLWAY CAPACITY

The uncontrolled, timber crib, reinforced concrete capped, wide crested spillway is 59 feet wide and the maximum head possible between the crest of the spilwlay and the top of the dam is 3 feet. The computed capacity at maximum head is 800 cfs.

5.4 RESERVOIR CAPACITY

The lengths of reservoir and that of shoreline are 0.9 miles and 2.8 miles respectively. The reservoir capacity at spillway crest is 2100 acre-feet and the same at the top of the dam is 2600 acre-feet. The storage capacity curve is shown in Appendix D. The curve indicates a surcharge sotrage above spillway crest of 500 acre-feet which is equivalent to a runoff depth of 1.2 inches over the drainage area.

5.5 FLOODS OF RECORD

The highest and lowest water levels recorded since completion of Irving Pond Dam are as follows:

	Date	Elevation (feet)	Discharge (cfs)
Highest	March 9, 1936	1709.6	750
Lowest	Unknown		

5.6 OVERTOPPING POTENTIAL

The 1/2 PMF and PMF outflows are 4,400 cfs and 9,400 cfs compared to a spillway capacity of 800 cfs. Hence, the dam will be overtopped by 2.2 feet and 4.1 feet of water due to 1/2 PMF and PMF respectively.

Flood stage at the bridge for State Highways 10 and 29A approximately 3,600 feet downstream of the dam will remain 4 1/2 feet below the road surface due to PMF.

However, the dam break analysis indicates that the bridge will be overtopped by .9 feet and 1.2 feet of water due to 1/2 PMF and PMF respectively.

5.7 EVALUATION

The spillway is considered inadequate to pass all floods in excess of 9% of the PMF. Dam break analysis, assuming complete breaching of the embankment, indicates that water surface levels downstream of the dam could reach levels which would pose a significant danger to residents. The spillway is, therefore, adjudged as seriously inadequate and the dam is assessed as unsafe, non-emergency.

SECTION 6: STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

The visual observations did not indicate any sign of major distress in connection with earth embankment. The spillway, however, is in poor shape. The spillway slab cracked and spalled in many places exposing reinforcement bars. Cracks separated the two end walls and the spillway slab from the sheet pile along the entire width of the spillway. There are a number of voids underneath the spillway, the biggest one is about 4 feet in diameter and 5 feet deep. Water flowing through the cracked south end wall is scouring the embankment.

b. Design and Construction Data

No design computations or other data regarding the structural stabiltiy of the spillway or the earth embankments are available.

c. Operating Records

No records of operation are available and no major operational problems were reported.

d. Post-Construction Changes

The dam and its appurtenant structures were constructed in 1865 and extensively repaired or reconstructed in 1913-14 by Durey Land and Lumber Company, Green Lake, Fulton County, New York. The 4 feet diameter steel pipe was installed by Adirondack Power and Light Corporation in 1926. Timber spillway apron was replaced by a reinforced concrete slab with concrete end walls in 1931 by New York Power and Light Corporation, Albany, New York. Steel sheet pile cut off was installed along the line of existing timber sheathing and a new intake well and intake pipe connecting to the existing 4 feet discharge pipe were constructed the same year. Additional fill was placed on the upstream side of the dam and the downstream rock fill was trimmed to uniform slope at the same time.

e. Seismic Stability

The dam is located in seismic zone 2. Insufficient information is available to conduct a stability analysis which would include seismic forces.

SECTION 7: ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Phase 1 inspection of Irving Pond Dam revealed that the spillway is seriously inadequate and outflows from either the PMF or 1/2 PMF would overtop the dam. This overtopping could cause breaching of the dam and the resulting floodwave would significantly increase the hazard to downstream residents. For this reason, the dam has been assessed as unsafe, non-emergency.

The earth embankment is not considered to be unstable. However, voids beneath the spillway and seepage through it may lead to the development of hazardous conditions.

b. Adequacy of Information

The information reviewed is adequate except that conditions beneath the spillway slab are unknown.

c. Need for Additional Investigations

1. Additional hydrologic/hydraulic investigations are required to more accurately determine the site specific characteristics of the watershed, and their influence on the downstream flooding potential.

2. Subsurface investigations of the spillway and its foundation including all sampling and laboratory testing necessary to perform a complete stability analysis of the existing structure are required.

3. Investigations should also be undertaken to determine the exact nature and cause of the observed seepage at the toe of the dam.

d. Urgency

The additional investigations which are needed should commence within 3 months of the date of notification and be completed within one year from the same date. Within 18 months of the date of notification, appropriate mitigating measures should have been completed.

Continuous monitoring of the reservoir levels during periods of heavy rainfall and runoff should be instituted by the owner. In addition, a contingency plan must be prepared in the event of overtopping.

The deficiencies outlined in the following section should be corrected in accordance with the time frame listed therein.

7.2 RECOMMENDED MEASURES

a. Results of the aforementioned investigations will determine the remedial measures required for the spillway and the control of the observed seepage.

b. After completion of the hydrologic analysis, additional spillway capacity may be required so that the total capacity is adequate to pass the half PMF.

c. The joint between the valve and the outlet pipe should be sealed within 6 months of the date of notification.

Additional improvements listed below should be accomplished immediately.

1. Vegetative growth on the embankment and along the walls of the low-level outlet should be removed.

2. The reservoir drain system should be periodically and systematically inspected and repaired as required.

3. Water flowing through the cracked south end wall should be diverted back over the spillway in order to avoid erosion of the embankment.

4. Initiate a program of periodic inspection and maintenance of the dam and appurtenances. Document this information for future reference and develop an operations manual.

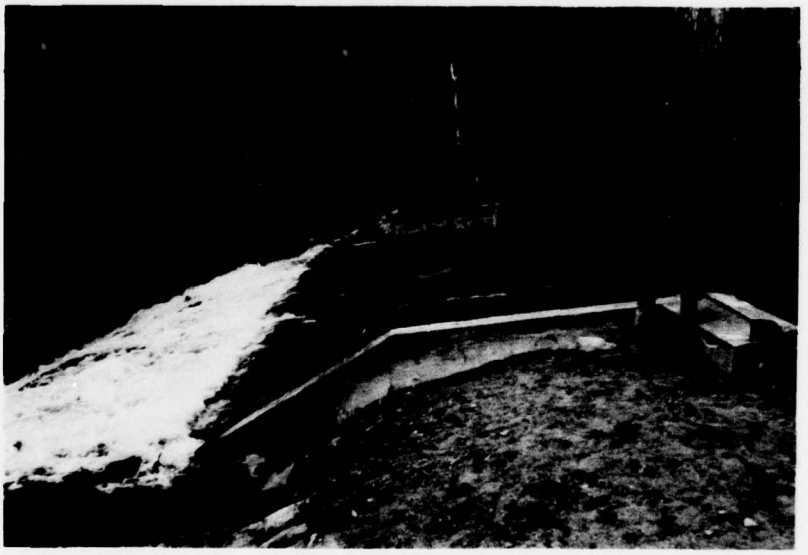
APPENDIX A

PHOTOGRAPHS

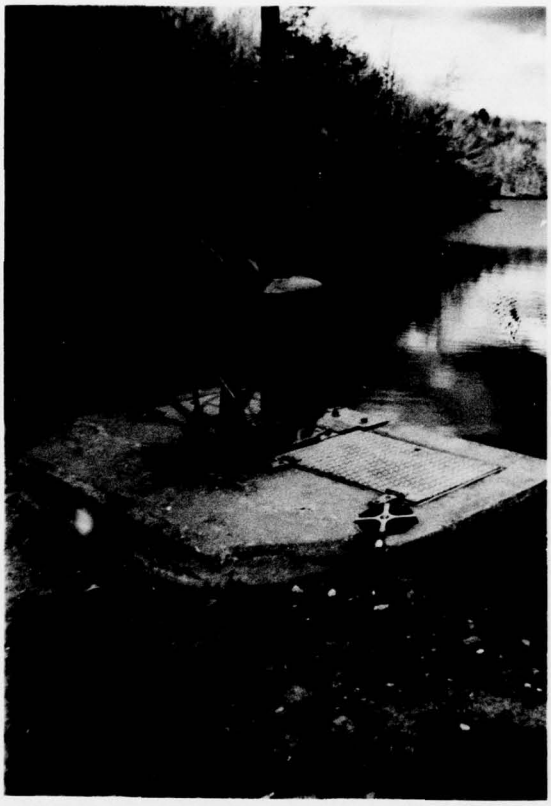
Top of Dam Looking North

Upstream face of dam

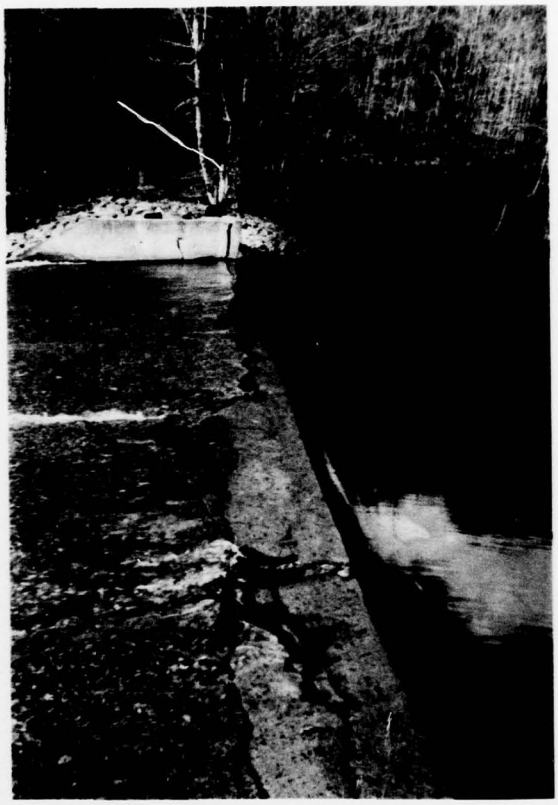
Downstream face of dam
Looking North



Spillway Looking North



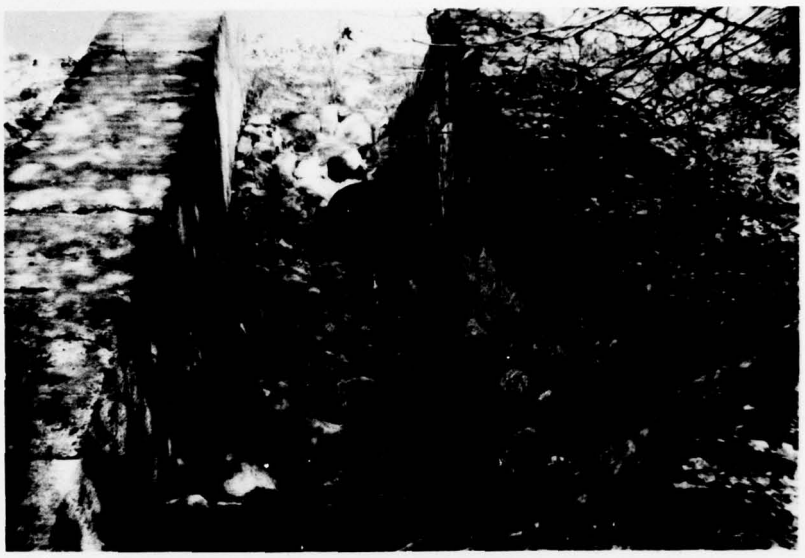
Sluice Gate Mechanism



Spillway Looking North
note cracked and spalled concrete
resulting from sheet piling

Void under north wall of spillway

Downstream area looking west



Low level outlet looking east

South wall of low level outlet channel
note spalling of concrete

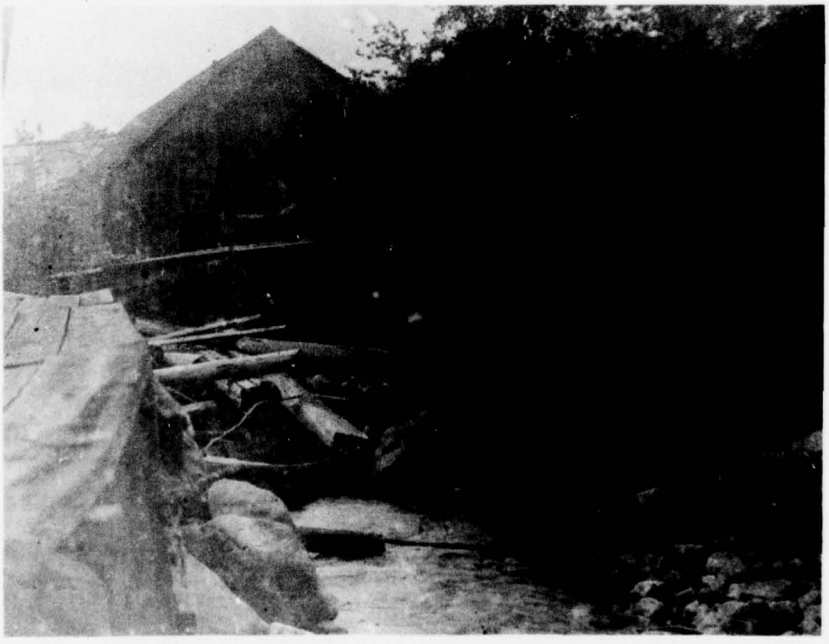
North wall of low level outlet channel
note cracking of concrete

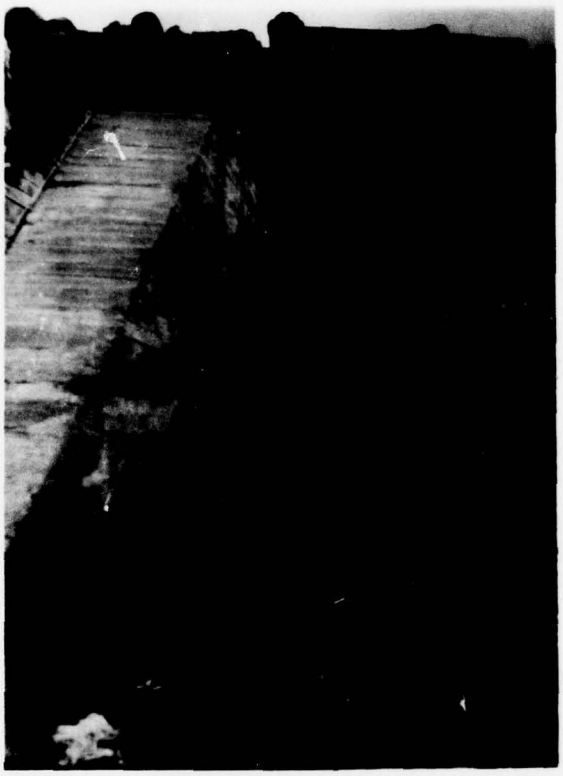
Downstream Channel - Bridge NY Rts 10 & 29A

Downstream Channel
Looking Upstream from Bridge

OLD PHOTOGRAPHS

JULY 22, 1914





VIEW OF LOW LEVEL OUTLET

OLD PHOTOGRAPH

(date unknown)

APPENDIX B

ENGINEERING DATA CHECKLIST

Check List
Engineering Data
Design Construction Operation

Name of Dam IRVING POND

I.D. # _____

Item	Remarks		
	Plans	Details	Typical Sections
Dam	Yes	no	Yes
Spillway(s)	Yes	no	Yes
Outlet(s)	Yes	Yes	no
Design Reports	none.		
Design Computations	none		
Discharge Rating Curves			
Dam Stability	none		
Seepage Studies	none		
Subsurface and Materials Investigations	none		

Item	Remarks
onstruction History	Limited to modifications listed below
urveys, Modifications, ost-Construction Engineering tudies and Reports	constructed 1865 repaired or reconstructed 1913-19, 1926, and 1934 No studies or reports
ccidents or Failure of Dam Description, Reports	none reported
peration and Maintenance Records Operation Manual	any information on file with NiagaraMohawk No manual

APPENDIX C

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam IRVING POND

I.D. # N.Y. 174

Location: Town CAROGA County FULTON

Stream Name IRVING POND OUTLET

Tributary of FLOWING INTO CANADA LAKE

Longitude (W), Latitude (N) 74°28'29" 43°9'40"

Hazard Category C

Date(s) of Inspection OCTOBER 16, 1978 and March 21, 1979

Weather Conditions 30's CLEAR

b. Inspection Personnel BOB McCARTY, MUHAMMAD ISLAM
BOB LEVETT, LOU PRATT

c. Persons Contacted BOB LEVETT, NIAGRA MOHAWK POWER CORPORATION, SYRACUSE, N.Y. 13202 TEL. (315) 474-1511

d. History:

Date Constructed 1865. EXTENSIVELY REPAIRED OR RECONSTRUCTED IN 1913-14, 1926 AND 1931

Owner NIAGRA MOHAWK POWER CORPORATION

Designer UNKNOWN

Constructed by UNKNOWN

2) Technical Data

Type of Dam TIMBER CRIB WITH EARTH AND ROCK FILLED.

Drainage Area 7.7 SQUARE MILES

Height 26 FEET Length 284 FEET INCLUDING SPILLWAY

Upstream Slope 2:1 Downstream Slope 2.25:1

2) Technical Data (Cont'd.)

External Drains: on Downstream Face NONE @ Downstream Toe NONE

Internal Components:

Impervious Core STEEL SHEET PILE ON THE FACE OF SPILLWAY

Drains NONE

Cutoff Type NONE

Grout Curtain NONE

3) Embankment

Stone Fill crest & slopes (riprap)

a. Crest

(1) Vertical Alignment good

(2) Horizontal Alignment good

(3) Surface Cracks none evident

(4) Miscellaneous

b. Slopes

(1) Undesirable Growth or Debris, Animal Burrows some debris and trees around walls of low level outlet / some trees at both abutments

(2) Sloughing, Subsidence or Depressions void in crest adjacent to spillway wall (~~west~~ right) - no problem with spillway or wall above - recommend backfill with stone & observe

(3) Slope Protection Large stone fill or heavy riprap good condition

(4) Surface Cracks or Movement at Toe none evident

(5) Seepage seepage from several sources however this is to be expected in a rock fill dam - no evidence of fines or discoloration / water over spillway also seeping into rock would augment seepage

(6) Condition Around Outlet Structure riprap all around some seepage not from pipe - no problem

c. Abutments

(1) Erosion at Embankment and Abutment Contact none

(2) Seepage along Contact of Embankment and Abutment

none

(3) Seepage at toe or along downstream face some seepage through rock - spillway flow was disappearing into rock also

d. Downstream Area - below embankment

(1) *Subsidence, Depressions, etc.*

none

(2) Seepage, unusual growth none

(3) Evidence of surface movement beyond embankment toe

none

(4) Miscellaneous

e. Drainage System

none

(1) Condition of relief wells, drains, etc. _____

None

(2) Discharge from Drainage System _____

None

4) Instrumentation

(1) Monumentation/Surveys NONE

(2) Observation Wells NONE

(3) Weirs NONE

(4) Piezometers NONE

(5) Other NONE

5) Reservoir

a. Slopes OK.

b. Sedimentation NOT REPORTED

6) Spillway(s) (including tail race channel)

TIMBER CRIB SPILLWAY WITH REINFORCED CONCRETE SLAB.

a. General SPILLWAY IN BAD SHAPE. THE BROAD CRESTED REINFORCED CONCRETE SPILLWAY SLAB IS BROKEN AND CRACKED IN MANY PLACES. VOIDS UNDERNEATH THE SPILLWAY. ONE VOID ABOUT 4' DIA AND 5' DEEP.

b. Principle Spillway SEPERATION OF R.C. SPILLWAY SLAB AND STEEL SHEET PILE FACING IS COMPLETE. BOTH THE ABUTMENTS CRACKED OPEN EXPOSING SHEET PILES. REBARS EXPOSED THRUGH CRACKS IN SPILLWAY. WATER FLOWING THROUGH BROKEN ABUTMENT WALL SCOURED EMBANKMENT.

c. Emergency or Auxiliary Spillway ~~4 FEET [illegible] DIAMETER STEEL~~ RCPE NONE

d. Condition of Tail race channel CLEAN. GOOD.

e. Stability of Channel side/slopes OK.

7) Downstream Channel

a. Condition (debris, etc.) CLEAN

b. Slopes O.K.

c. Approximate number of homes Numerous homes on shoreline - backwaters of Canada Lake to which Irving Pond Outlet flows

8) Miscellaneous Outlet conduit (low level) pipe is distorted and rusted - joint between valve section & conduit is displaced approx. ½ inch some seepage is exiting thru joint from slight leak in valve pipe distortion is probably due to placemt of heavy stone on top of pipe monitor periodically in future 1 a month perferable

9) Structural

a. Concrete Surfaces

b. Structural Cracking some cracking & spalling of low level outlet wing walls cracking of spillway slab & return walls due to expansion & contraction (differential) from cut-off sheeting (steel-interlocking)

c. Movement - Horizontal & Vertical Alignment (Settlement) Spillway section & low level outlet walls appear unchanged in alignment

d. Junctions with Abutments or Embankments good condition

e. Drains - Foundation, Joint, Face none

f. Water passages, conduits, sluices see low level outlet pipe comments section "8"

g. Seepage or Leakage none apparent through concrete sections

h. Joints - Construction, etc. Low level outlet walls - construction joints appear to be separating

i. Foundation unknown

j. Abutments cracking in area of sheet piling cut-off

k. Control Gates operational

l. Approach & Outlet Channels approach under water - not observed outlet channel over flow rock face - rock was grouted in the past & readjustment of stone has caused cracking so that spillway flow was flowing into rock

m. Energy Dissipators (plunge pool, etc.)

n. Intake Structures for gate valve of low level outlet operational and accessable

o. Stability appears good

p. Miscellaneous

APPENDIX D

HYDROLOGIC/HYDRAULIC

ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	1710		2600
2) Design High Water (Max. Design Pool)	1708.5		2250
3) Auxiliary Spillway Crest	-		-
4) Pool Level with Flashboards	-		-
5) Service Spillway Crest	1707		2100

DISCHARGES

	Volume (cfs)
1) Average Daily	Unknown
2) Spillway @ Maximum High Water	800
3) Spillway @ Design High Water	800
4) Spillway @ Auxiliary Spillway Crest Elevation	-
5) Low Level Outlet	200
6) Total (of all facilities) @ Maximum High Water	1900
7) Maximum Known Flood	750

CREST: DAM ELEVATION: 1710.0

Type: TIMBER WITH ~~BLACKTOP~~ ROCK FILL AND EARTH

Width: VARIABLE: 10 TO 24 FEET Length: 284 FEET INCLUDING SPILLWAY

Spillover TIMBER CRIB WITH REINFORCED CONCRETE SPILLWAY APRON

Location AT ABOUT MIDDLE OF EMBANKMENT

SPILLWAY:

PRINCIPAL		EMERGENCY
1707	Elevation	NONE
TIMBER CRIB, WITH REC TOP	Type	
59 FEET - 10 FEET BREADTH	Width	
	Type of Control	
YES	Uncontrolled	
	Controlled:	
NONE	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
—	Chute Length	
NONE	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

OUTLET STRUCTURES/EMERGENCY DRAWDOWN FACILITIES:

Type: Gate _____ Sluice _____ Conduit ✓ Penstock _____

Shape : CIRCULAR

Size: 2 - 3' DIA PIPES AT INTAKE. 1 - 4' DIA PIPE AT OUTLET

Elevations: Entrance Invert 1688

Exit Invert 1687

Tailrace Channel: Elevation 1684

HYDROMETEROLOGICAL GAGES:

Type : NONE

Location: _____

Records:

Date - _____

Max. Reading - _____

FLOOD WATER CONTROL SYSTEM:

Warning System: NONE

Method of Controlled Releases (mechanisms):

THROUGH THE 4' DIA LOW LEVEL OUTLET ONLY.

NO RELEASE REQUIRED. MANUAL CONTROL MECHANISM ON TOP OF DAM.

DRAINAGE AREA: 7.7 SQUARE MILES

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: WOODED

Terrain - Relief: HILLY

Surface - Soil: —

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

NONE

Potential Sedimentation problem areas (natural or man-made; present or future)

NONE

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

NONE

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: NONE

Elevation:

Reservoir:

Length @ Maximum Pool 0.9 (Miles)

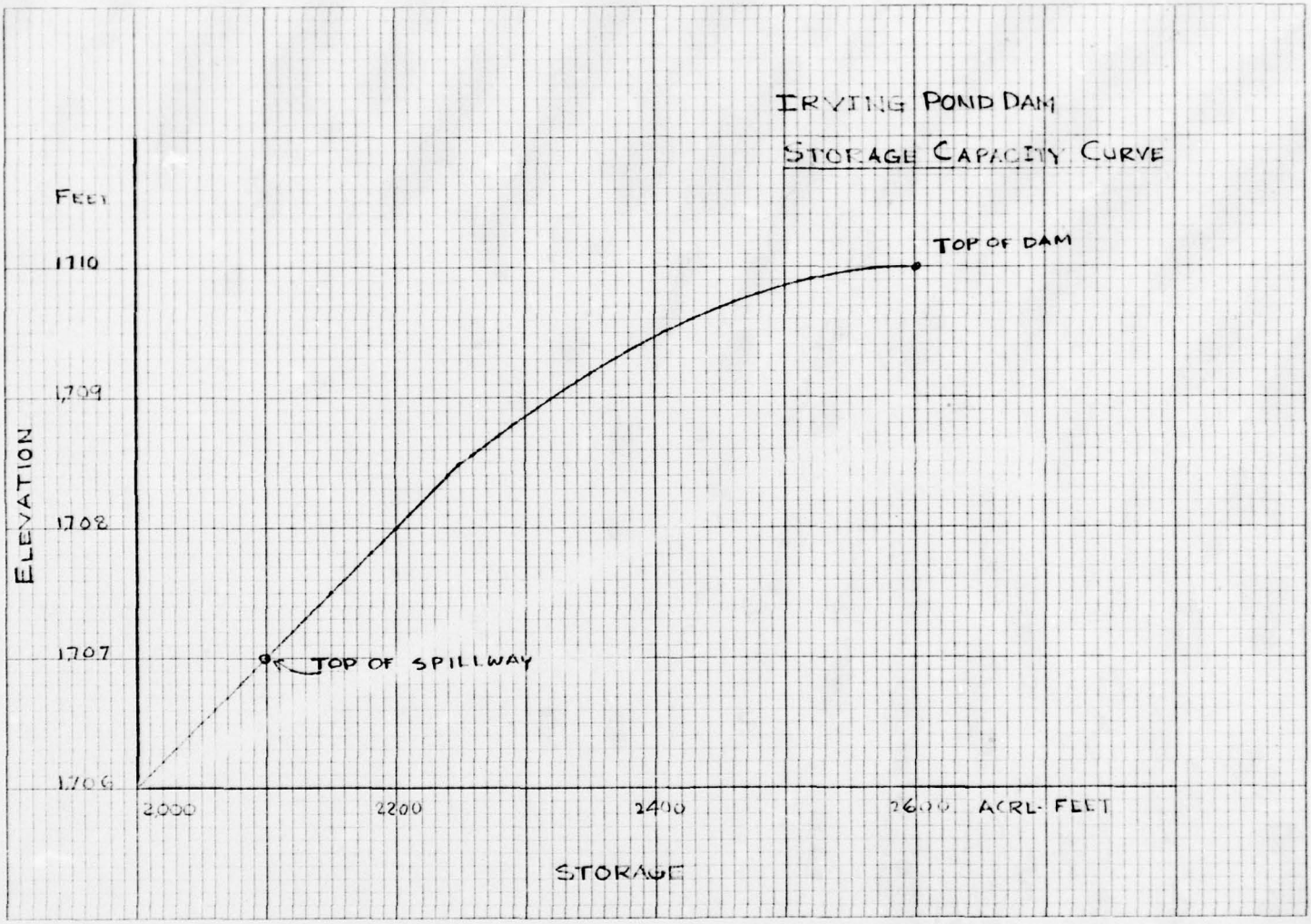
Length of Shoreline (@ Spillway Crest) 2.8 (Miles)

Storage Capacity Curve

ELEVATION (FEET)	VOLUME (ACRE-FEET)
1707.0	2100
1707.5	2150
1708.0	2200
1708.5	2250
1710.0	2630

K&E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO MADE IN U.S.A.

46 0700



SPILLWAY RATING CURVE

$Q = CLH^{3/2}$ Where

Q = Discharge Over Spillway

C = Coefficient of Discharge

L = Length of Spillway

H = Head of water over Spillway

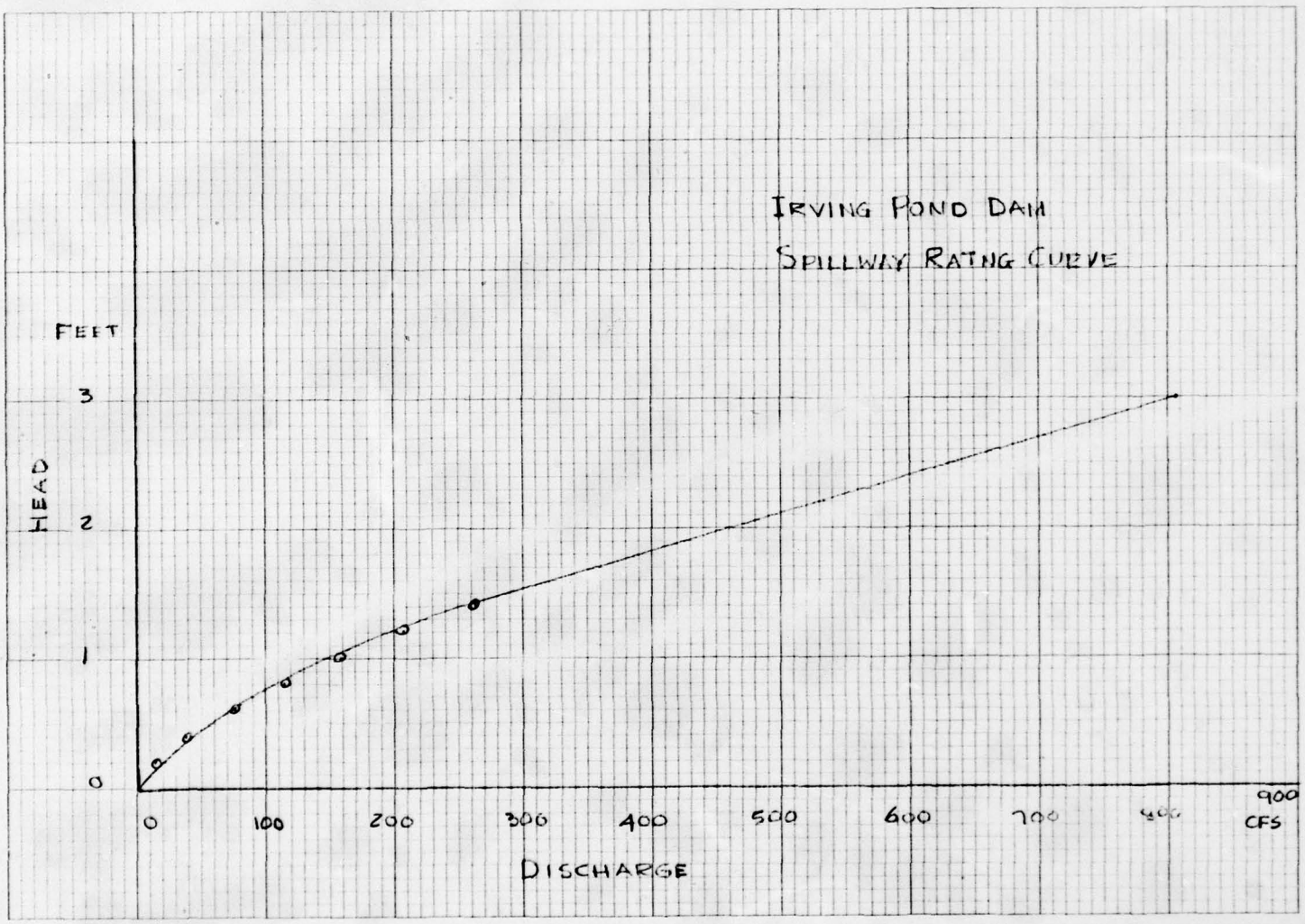
B = Breadth of Spillway

= 10 feet.

H (ft.)	C	L(ft)	Q (cfs)
.2	2.49	59	13
.4	2.56	59	38
.6	2.70	59	74
.8	2.69	59	114
1.0	2.68	59	158
1.2	2.69	59	209
1.4	2.67	59	261
1.5	2.65	59	287
3.0	2.64	59	809

Values of 'C' from Handbook of Hydraulics by King and Brater. Page 5-46.

46 0700



IRVING POND DAM

D.A. = Drainage area in square miles

L = River mileage from the given station to the upstream limit of the drainage area

LCA = River mileage from the station to the center of gravity of the drainage area

PMP = Probable Maximum Precipitation in inches

t_p = Lag time from mid-point of unit rainfall duration, t_r, to peak of unit hydrograph, in hours.

t_r = Unit rainfall duration, equal to $\frac{t_p}{550}$, in hours.

C_t = Coefficient depending upon units and drainage basin characteristics

t_R = Unit rainfall duration other than standard unit, t_r, adopted in specific study, in hours.

t_{pR} = Lag time from mid-point of unit rainfall duration t_R, to peak of unit hydrograph, in hours

D.A = 7.7 square miles, L = 5.49 miles, LCA = 2.69 miles

PMP = 19.3 inches C_t = 2 ,

C_p = 0.625 from average 640 Cp = 400

$t_p = C_t (L \cdot L_{CA})^{0.3} = 2 (5.49 \times 2.69)^{.3} = 4.49$ hours

$t_r = \frac{t_p}{5.5} = \frac{4.49}{5.5} = .82$ hours (Use 1 hr. hydrograph)

$t_{pR} = t_p + 0.25 (t_R - t_r) = 4.5 + .25(1 - .82) = 4.55$ hrs.

From HMR 33 – Figure 2, Depth - Area - Duration

6 hour % 111 = , 12 hour % = 123

24 hour % 133 = , 48 hour % = 142

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  25 SEP 78
**********
    1                 A1  IRVING POND DAM NY 174 MOHAWK
    2                 A2  HYDRAULIC/HYDROLOGIC ANALYSIS OF IRVING POND DAM
    3                 A3  RATIOS OF PMF ROUTED THROUGH THE RESERVOIR AND DOWNSTREAM
    4                 B     100       1       0       0       0       0       0       0       0       0
    5                 B1      5
    6                 J       1       2       1
    7                 J1     .5       1
    8                 K       0       1       0       0       0       0       1
    9                 K1  CALCULATION INFLOW HYDROGRAPH TO IRVING POND
   10                 I       1       1     7.7       0     7.7       0       0       0       1
   11                 P       0    19.3     111     123     133     142       0       0
   12                 T       0       0       0       0       0       0       1     0.1       0
   13                 T1   4.55    .625       0
   14                 X    15.4    15.4       1
   15                 K       1       2                                               1
   16                 K1  ROUTED FLOW THROUGH IRVING POND
   17                 Y                               1       1
   18                 Y1      1                                               2127       0
   19                 S5   2127    2155    2183    2211    2239    2267    2295    2337    2630    3730
   20                 SE   1707  1707.2  1707.4  1707.6  1707.8  1708.0  1708.2  1708.5    1710    1715
   21                 S5   1707      59     2.7     1.5
   22                 SD   1710     2.7     1.5     290
   23                 K       1       3       0       0       0       0       1
   24                 K1  CHANNEL ROUTING MOD-PULS REACH 2-3
   25                 Y                               1       1
   26                 Y1      1
   27                 X6    .04     .05     .04  1555.5    1580    3600   .0357
   28                 Y7      0    1571     100    1570     110  1568.5     112  1555.5     135  1555.5
   29                 X7    137  1568.5     147    1570     250    1571
   30                 K      99
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
ROUTE HYDROGRAPH TO	3
END OF NETWORK	

```
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  25 SEP 78
**********************************

RUN  DATE= 04/10/79
     TIME= 08.12.28.


                IRVING POND DAM NY 174 MOHAWK
                HYDRAULIC/HYDROLOGIC ANALYSIS OF IRVING POND DAM
                RATIOS OF PMF ROUTED THROUGH THE RESERVOIR AND DOWNSTREAM

                                    JOB SPECIFICATION
          IO      NHR     NMIN     IDAY      IHR     IMIN    METRC     IPLT     IPRT    NSTAN
         100        1        0        0        0        0        0        0        0        0
                                   JOPER      NWT    LROPT    TRACE
                                       5        0        0        0


                                MULTI-PLAN ANALYSES TO BE PERFORMED
                                    NPLAN= 1 NRTIO= 2 LRTIO= 1
                    RTIOS=     .50    1.00

**********          **********          **********          **********          **********

                                    SUB-AREA RUNOFF COMPUTATION

                CALCULATION INFLOW HYDROGRAPH TO IRVING POND

                                ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME  ISTAGE    IAUTO
                                    1        0        0        0        0        0        1        0        0

                                    HYDROGRAPH DATA
                    IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
                        1        1     7.70     0.00     7.70     0.00    0.000        0        1        0

                                    PRECIP DATA
                              SPFE      PRS       R6      R12      R24      R48      R72      R96
                              0.00    19.20   111.00   123.00   133.00   142.00     0.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS  .800

                                    LOSS DATA
                LROPT    STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
                    0     0.00     0.00     1.00     0.00     0.00     1.00     1.00      .10     0.00     0.00

                                UNIT HYDROGRAPH DATA
                                TP=  4.55    CP= .63    NTA=  0

                                RECESSION DATA
                                STRTQ=   15.40    QRCSN=   15.40    RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 5.23 AND R= 4.22 INTERVALS

                UNIT HYDROGRAPH 26 END-OF-PERIOD ORDINATES, LAG=  4.54 HOURS, CP=  .63  VOL= 1.00
              62.      225.      434.      608.      679.      620.      495.      390.      308.      242.
             191.      151.      119.       94.       74.       58.       46.       36.       28.       22.
              14.       14.       11.        9.        7.        5.
```

0 END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	1.00	1	.01	0.00	.01	15.	1.03	3.00	51	0.00	0.00	0.00	2661.
1.01	2.00	2	.01	0.00	.01	15.	1.03	4.00	52	0.00	0.00	0.00	2116.
1.01	3.00	3	.01	0.00	.01	15.	1.03	5.00	53	0.00	0.00	0.00	1676.
1.01	4.00	4	.01	0.00	.01	15.	1.03	6.00	54	0.00	0.00	0.00	1325.
1.01	5.00	5	.01	0.00	.01	15.	1.03	7.00	55	0.00	0.00	0.00	1047.
1.01	6.00	6	.01	0.00	.01	15.	1.03	8.00	56	0.00	0.00	0.00	829.
1.01	7.00	7	.02	0.00	.02	15.	1.03	9.00	57	0.00	0.00	0.00	655.
1.01	8.00	8	.02	0.00	.02	15.	1.03	10.00	58	0.00	0.00	0.00	519.
1.01	9.00	9	.02	0.00	.02	15.	1.03	11.00	59	0.00	0.00	0.00	411.
1.01	10.00	10	.02	0.00	.02	15.	1.03	12.00	60	0.00	0.00	0.00	327.
1.01	11.00	11	.02	0.00	.02	15.	1.03	13.00	61	0.00	0.00	0.00	260.
1.01	12.00	12	.02	0.00	.02	15.	1.03	14.00	62	0.00	0.00	0.00	207.
1.01	13.00	13	.12	0.00	.12	15.	1.03	15.00	63	0.00	0.00	0.00	160.
1.01	14.00	14	.14	0.00	.14	15.	1.03	16.00	64	0.00	0.00	0.00	121.
1.01	15.00	15	.17	0.00	.17	15.	1.03	17.00	65	0.00	0.00	0.00	88.
1.01	16.00	16	.44	.03	.41	17.	1.03	18.00	66	0.00	0.00	0.00	45.
1.01	17.00	17	.16	.06	.10	26.	1.03	19.00	67	0.00	0.00	0.00	29.
1.01	18.00	18	.13	.03	.10	44.	1.03	20.00	68	0.00	0.00	0.00	19.
1.01	19.00	19	.01	0.00	.01	66.	1.03	21.00	69	0.00	0.00	0.00	18.
1.01	20.00	20	.01	0.00	.01	85.	1.03	22.00	70	0.00	0.00	0.00	17.
1.01	21.00	21	.01	0.00	.01	92.	1.03	23.00	71	0.00	0.00	0.00	17.
1.01	22.00	22	.01	0.00	.01	87.	1.04	0.00	72	0.00	0.00	0.00	16.
1.01	23.00	23	.01	0.00	.01	75.	1.04	1.00	73	0.00	0.00	0.00	16.
1.02	0.00	24	.01	0.00	.01	62.	1.04	2.00	74	0.00	0.00	0.00	15.
1.02	1.00	25	.10	.00	.10	52.	1.04	3.00	75	0.00	0.00	0.00	15.
1.02	2.00	26	.10	.00	.10	45.	1.04	4.00	76	0.00	0.00	0.00	15.
1.02	3.00	27	.10	.00	.10	40.	1.04	5.00	77	0.00	0.00	0.00	15.
1.02	4.00	28	.10	.00	.10	37.	1.04	6.00	78	0.00	0.00	0.00	15.
1.02	5.00	29	.10	.00	.10	36.	1.04	7.00	79	0.00	0.00	0.00	15.
1.02	6.00	30	.10	.00	.10	34.	1.04	8.00	80	0.00	0.00	0.00	15.
1.02	7.00	31	.31	.21	.10	46.	1.04	9.00	81	0.00	0.00	0.00	15.
1.02	8.00	32	.31	.21	.10	92.	1.04	10.00	82	0.00	0.00	0.00	15.
1.02	9.00	33	.31	.21	.10	181.	1.04	11.00	83	0.00	0.00	0.00	15.
1.02	10.00	34	.31	.21	.10	305.	1.04	12.00	84	0.00	0.00	0.00	15.
1.02	11.00	35	.31	.21	.10	445.	1.04	13.00	85	0.00	0.00	0.00	15.
1.02	12.00	36	.31	.21	.10	572.	1.04	14.00	86	0.00	0.00	0.00	15.
1.02	13.00	37	1.71	1.61	.10	761.	1.04	15.00	87	0.00	0.00	0.00	15.
1.02	14.00	38	2.56	1.96	.10	1179.	1.04	16.00	88	0.00	0.00	0.00	15.
1.02	15.00	39	2.57	2.47	.10	1962.	1.04	17.00	89	0.00	0.00	0.00	15.
1.02	16.00	40	6.31	6.41	.10	3376.	1.04	18.00	90	0.00	0.00	0.00	15.
1.02	17.00	41	2.40	2.30	.10	5432.	1.04	19.00	91	0.00	0.00	0.00	15.
1.02	18.00	42	1.89	1.79	.10	7634.	1.04	20.00	92	0.00	0.00	0.00	15.
1.02	19.00	43	.15	.05	.10	9301.	1.04	21.00	93	0.00	0.00	0.00	15.
1.02	20.00	44	.15	.05	.10	9522.	1.04	22.00	94	0.00	0.00	0.00	15.
1.02	21.00	45	.15	.05	.10	9343.	1.04	23.00	95	0.00	0.00	0.00	15.
1.02	22.00	46	.15	.05	.10	8004.	1.05	0.00	96	0.00	0.00	0.00	15.
1.02	23.00	47	.15	.05	.10	6530.	1.05	1.00	97	0.00	0.00	0.00	15.
1.03	0.00	48	.15	.05	.10	5219.	1.05	2.00	98	0.00	0.00	0.00	15.
1.03	1.00	49	0.00	0.00	0.00	4170.	1.05	3.00	99	0.00	0.00	0.00	15.
1.03	2.00	50	0.00	0.00	0.00	3334.	1.05	4.00	100	0.00	0.00	0.00	15.
									SUM	21.92	18.25	3.67	91815.
										(557.)	(464.)	(93.)	(2599.91)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9922.	8364.	3666.	1269.	91817.
CMS	281.	237.	104.	36.	2600.
INCHES		10.10	17.72	18.40	18.49
CM		256.66	450.03	467.45	469.58
AC-FT		4147.	7272.	7554.	7588.
THOUS CU M		5116.	8970.	9317.	9360.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
8.	8.	8.	8.	8.	9.	13.	22.	32.	42.
46.	43.	37.	31.	26.	23.	20.	19.	18.	17.
23.	46.	90.	153.	222.	286.	381.	590.	981.	1688.
2716.	3817.	4556.	4961.	4672.	4002.	3265.	2609.	2085.	1667.
1331.	1058.	838.	662.	524.	414.	328.	259.	206.	163.
130.	104.	80.	60.	44.	23.	15.	9.	9.	9.
8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
8.	8.	8.	8.	8.	8.	8.	8.	8.	8.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4961.	4182.	1833.	635.	43908.
CMS	140.	118.	52.	18.	1300.
INCHES		5.05	8.86	9.20	9.24
MM		128.33	225.02	233.72	234.79
AC-FT		2074.	3636.	3777.	3794.
THOUS CU M		2558.	4485.	4659.	4680.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	17.	26.	44.	66.	85.
92.	87.	75.	62.	52.	45.	40.	37.	36.	34.
46.	92.	181.	305.	445.	572.	761.	1179.	1962.	3376.
5432.	7634.	9301.	9922.	9343.	8004.	6530.	5219.	4170.	3334.
2691.	2116.	1676.	1325.	1047.	829.	655.	519.	411.	327.
260.	207.	165.	121.	88.	45.	29.	19.	18.	17.
17.	16.	14.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9922.	8364.	3666.	1269.	91817.
CMS	281.	237.	104.	36.	2600.
INCHES		10.10	17.72	18.40	18.49
MM		256.66	450.03	467.45	469.58
AC-FT		4147.	7272.	7554.	7588.
THOUS CU M		5116.	8970.	9317.	9360.

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HYDROGRAPH ROUTING

ROUTED FLOW THROUGH IRVING POND

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	2127.	0

CAPACITY=	2127.	2155.	2183.	2211.	2239.	2267.	2295.	2337.	2630.	3730.
ELEVATION=	1707.	1707.	1707.	1708.	1708.	1708.	1708.	1709.	1710.	1715.

CREL	SPWID	COQW	EXPW	ELEVL	COOL	CAREA	EXPL
1707.0	59.0	2.7	1.5	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1710.0	2.7	1.5	290.

STATION 2, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
2.	2.	2.	2.	2.	3.	3.	3.	4.	6.
9.	9.	11.	13.	13.	14.	15.	15.	15.	15.
16.	17.	20.	27.	40.	60.	88.	135.	223.	372.
623.	1222.	2577.	3793.	4394.	4300.	3931.	3366.	2814.	2334.
1933.	1604.	1335.	1120.	951.	832.	759.	687.	619.	556.
496.	447.	400.	359.	321.	285.	244.	210.	182.	159.
139.	123.	109.	98.	88.	79.	72.	65.	60.	55.
50.	46.	43.	40.	37.	35.	33.	31.	29.	27.
25.	24.	23.	22.	21.	20.	19.	19.	18.	17.

STORAGE

2128.	2128.	2129.	2129.	2130.	2131.	2131.	2132.	2132.	2133.
2133.	2134.	2134.	2135.	2135.	2136.	2136.	2138.	2140.	2142.
2145.	2148.	2151.	2153.	2154.	2155.	2155.	2156.	2156.	2156.
2157.	2158.	2162.	2170.	2183.	2200.	2221.	2252.	2302.	2388.
2529.	2723.	2915.	3049.	3109.	3106.	3064.	3005.	2943.	2886.
2833.	2785.	2742.	2703.	2667.	2632.	2597.	2561.	2527.	2493.
2462.	2432.	2405.	2379.	2356.	2333.	2313.	2295.	2280.	2267.
2255.	2245.	2236.	2228.	2221.	2215.	2209.	2204.	2200.	2196.
2192.	2189.	2185.	2183.	2180.	2178.	2176.	2174.	2172.	2170.
2169.	2167.	2166.	2165.	2163.	2162.	2161.	2160.	2160.	2159.

STAGE

1707.0	1707.0	1707.0	1707.0	1707.0	1707.0	1707.0	1707.0	1707.0	1707.0
1707.0	1707.0	1707.1	1707.1	1707.1	1707.1	1707.1	1707.1	1707.1	1707.1
1707.1	1707.2	1707.2	1707.2	1707.2	1707.2	1707.2	1707.2	1707.2	1707.2
1707.2	1707.4	1707.3	1707.3	1707.4	1707.5	1707.7	1707.9	1708.3	1708.8
1709.3	1710.4	1711.3	1711.9	1712.2	1712.2	1712.0	1711.7	1711.4	1711.2
1710.9	1710.7	1710.5	1710.3	1710.2	1710.0	1709.8	1709.6	1709.5	1709.3
1709.1	1709.0	1708.8	1708.7	1708.6	1708.5	1708.3	1708.2	1708.1	1708.0
1707.9	1707.8	1707.8	1707.7	1707.7	1707.6	1707.6	1707.6	1707.5	1707.5
1707.5	1707.4	1707.4	1707.4	1707.4	1707.4	1707.3	1707.3	1707.3	1707.3
1707.3	1707.3	1707.3	1707.3	1707.3	1707.3	1707.2	1707.2	1707.2	1707.2

PEAK OUTFLOW IS 4394. AT TIME 45.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4394.	3757.	1730.	631.	45534.
CMS	124.	106.	49.	18.	1289.
INCHES		4.54	8.36	9.14	9.17
CM		115.27	212.34	232.23	232.87
AC-FT		1863.	3431.	3753.	3763.
THOUS CU M		2298.	4232.	4629.	4642.

STATION 2, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	1.	1.	1.	2.	2.	3.	3.	4.
4.	5.	5.	6.	6.	6.	7.	9.	11.	15.
20.	25.	29.	32.	34.	35.	35.	36.	36.	36.
36.	39.	48.	66.	99.	149.	220.	325.	486.	810.
2137.	4562.	7070.	8833.	9405.	8881.	7749.	6482.	5327.	4359.
3567.	2919.	2391.	1951.	1614.	1337.	1117.	948.	830.	757.
695.	617.	555.	497.	444.	395.	350.	310.	270.	232.
201.	175.	154.	136.	121.	109.	98.	89.	81.	74.
68.	63.	58.	54.	51.	47.	45.	42.	40.	38.
36.	34.	33.	31.	30.	29.	28.	27.	26.	25.

STORAGE

2138.	2139.	2141.	2142.	2143.	2144.	2145.	2146.	2147.	2148.
2149.	2149.	2141.	2142.	2143.	2144.	2145.	2147.	2151.	2156.
2162.	2167.	2172.	2175.	2177.	2178.	2179.	2179.	2179.	2179.
2179.	2182.	2190.	2205.	2229.	2261.	2301.	2358.	2455.	2622.
2893.	3125.	3344.	3482.	3524.	3485.	3399.	3296.	3196.	3106.
3026.	2955.	2893.	2837.	2787.	2743.	2703.	2666.	2631.	2596.
2561.	2525.	2493.	2461.	2431.	2402.	2374.	2349.	2326.	2307.
2290.	2279.	2264.	2253.	2244.	2236.	2228.	2222.	2216.	2211.
2207.	2202.	2199.	2195.	2192.	2189.	2187.	2185.	2182.	2181.
2179.	2177.	2176.	2174.	2173.	2172.	2171.	2170.	2169.	2168.

STAGE

1707.0	1707.0	1707.0	1707.0	1707.0	1707.1	1707.1	1707.1	1707.1	1707.1
1707.1	1707.1	1707.1	1707.1	1707.1	1707.1	1707.1	1707.1	1707.2	1707.2
1707.2	1707.3	1707.3	1707.3	1707.4	1707.4	1707.4	1707.4	1707.4	1707.4
1707.4	1707.4	1707.4	1707.6	1707.7	1708.0	1708.2	1708.6	1709.1	1710.0
1711.1	1712.3	1713.2	1713.9	1714.1	1713.9	1713.5	1713.0	1712.6	1712.2
1711.8	1711.5	1711.2	1710.9	1710.7	1710.5	1710.3	1710.2	1710.0	1709.8
1709.6	1709.5	1709.3	1709.1	1709.0	1708.8	1708.7	1708.6	1708.4	1708.3
1708.2	1708.1	1708.0	1707.9	1707.8	1707.8	1707.7	1707.7	1707.6	1707.6
1707.6	1707.5	1707.5	1707.5	1707.5	1707.4	1707.4	1707.4	1707.4	1707.4
1707.4	1707.4	1707.3	1707.3	1707.3	1707.3	1707.3	1707.3	1707.3	1707.3

PEAK OUTFLOW IS 9405. AT TIME 45.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9405.	7925.	3537.	1265.	91338.
CMS	266.	224.	100.	36.	2586.
INCHES		9.57	17.09	18.33	18.39
CM		243.18	434.19	465.66	467.13
AC-FT		3930.	7016.	7525.	7549.
THOUS CU M		4847.	8655.	9282.	9311.

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HYDROGRAPH ROUTING

CHANNEL ROUTING MOD-PULS REACH 2-3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELMVT	ELMAX	RLNTH	SEL
.0400	.0500	.0400	1555.5	1580.0	3600.	.03570

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1571.00 100.00 1570.00 110.00 1568.50 112.00 1555.50 135.00 1555.50
137.00 1568.50 147.00 1570.00 250.00 1571.00

STORAGE	0.00	2.47	4.99	7.54	10.14	12.78	15.47	18.19	20.96	23.77
	26.62	30.27	43.18	69.82	96.46	123.10	149.74	176.39	203.03	229.67
OUTFLOW	0.00	196.81	563.89	1059.70	1644.18	2299.96	3015.89	3784.37	4600.00	5458.87
	6358.04	7308.25	9438.56	14596.11	22236.93	31937.07	43475.17	56703.99	71515.28	87824.56
STAGE	1555.50	1556.79	1558.04	1559.37	1560.65	1561.95	1563.24	1564.53	1565.82	1567.11
	1568.39	1569.68	1570.97	1572.26	1573.55	1574.84	1576.13	1577.42	1578.71	1580.00
FLOW	0.00	196.81	563.89	1059.70	1644.18	2299.96	3015.89	3784.37	4600.00	5458.87
	6358.04	7308.25	9438.56	14596.11	22236.93	31937.07	43475.17	56703.99	71515.28	87824.56

STATION 3, PLAN 1, RTIO 1

OUTFLOW

0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
2.	2.	2.	2.	2.	2.	3.	3.	4.	5.
7.	9.	11.	12.	13.	14.	15.	15.	15.	15.
15.	19.	19.	26.	38.	56.	83.	126.	209.	362.
597.	1178.	2478.	3768.	4370.	4383.	3944.	3399.	2830.	2360.
1947.	1622.	1347.	1131.	959.	838.	761.	692.	622.	560.
503.	451.	404.	362.	324.	288.	248.	212.	185.	163.
142.	129.	111.	99.	89.	80.	73.	66.	60.	55.
51.	47.	44.	40.	38.	35.	33.	31.	29.	28.
26.	25.	23.	22.	21.	20.	20.	19.	18.	17.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	2.	3.	4.
8.	8.	13.	18.	20.	20.	19.	17.	15.	13.
11.	10.	9.	8.	7.	6.	6.	6.	5.	5.
5.	4.	4.	4.	3.	3.	3.	3.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5
1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5
1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6
1555.6	1555.6	1555.6	1555.7	1555.8	1555.9	1556.1	1556.4	1556.9	1557.4
1558.2	1559.6	1562.3	1564.5	1565.5	1565.5	1564.8	1563.9	1562.9	1562.1
1561.3	1560.6	1560.0	1559.5	1559.1	1558.8	1558.6	1558.4	1558.2	1558.1
1557.9	1557.7	1557.5	1557.4	1557.3	1557.1	1557.0	1556.9	1556.8	1556.6
1556.5	1556.4	1556.3	1556.2	1556.1	1556.1	1556.0	1556.0	1555.9	1555.9
1555.9	1555.8	1555.8	1555.8	1555.8	1555.7	1555.7	1555.7	1555.7	1555.7
1555.7	1555.7	1555.7	1555.7	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME

CFS	4333.	3754.	1730.	631.	45531.
CMS	124.	106.	49.	18.	1289.
INCHES		4.54	8.36	9.14	9.17
MM		115.19	212.34	232.23	232.86
AC-FT		1861.	3431.	3753.	3763.
THOUS CU M		2296.	4232.	4629.	4641.

MAXIMUM STORAGE = 20.

MAXIMUM STAGE IS 1555.5

STATION 3, PLAN 1, RTIO 2

OUTFLOW

0.	0.	1.	1.	1.	2.	2.	3.	3.	4.
4.	5.	5.	5.	6.	6.	7.	8.	11.	14.
19.	24.	28.	31.	34.	35.	36.	36.	36.	36.
36.	38.	46.	63.	93.	140.	210.	318.	469.	784.
2040.	4462.	6977.	8694.	9422.	8944.	7806.	6493.	5399.	4369.
3619.	2927.	2423.	1967.	1639.	1343.	1134.	953.	839.	757.
692.	619.	560.	501.	448.	398.	358.	313.	274.	235.
203.	178.	159.	139.	124.	111.	100.	90.	82.	75.
69.	64.	59.	55.	51.	48.	45.	42.	40.	38.
36.	34.	33.	32.	30.	29.	28.	27.	26.	25.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	2.	3.	3.	4.	6.
12.	20.	28.	38.	43.	40.	32.	27.	24.	20.
18.	15.	13.	11.	10.	9.	8.	7.	6.	6.
6.	5.	5.	5.	4.	4.	4.	3.	3.	3.
3.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STAGE

1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5
1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.6	1555.6	1555.6
1555.6	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7
1555.8	1555.8	1555.8	1555.9	1556.1	1556.5	1556.9	1557.2	1557.8	1558.7
1561.4	1565.6	1569.1	1570.5	1571.0	1570.6	1569.9	1568.5	1567.0	1565.5
1564.2	1563.1	1562.2	1561.3	1560.6	1560.0	1559.5	1559.1	1558.8	1558.6
1558.4	1558.2	1558.1	1557.9	1557.7	1557.5	1557.4	1557.2	1557.1	1557.0
1556.8	1556.7	1556.6	1556.5	1556.4	1556.3	1556.2	1556.1	1556.1	1556.0
1556.0	1555.9	1555.9	1555.9	1555.9	1555.8	1555.8	1555.8	1555.8	1555.8
1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9422.	7935.	3537.	1265.	91334.
CMS	267.	225.	100.	36.	2586.
INCHES		9.59	17.09	18.33	18.39
MM		243.48	434.15	465.65	467.11
AC-FT		3939.	7016.	7525.	7548.
THOUS CU M		4853.	8654.	9282.	9311.

MAXIMUM STORAGE = 43.

MAXIMUM STAGE IS 1571.0

********** ********** ********** ********** **********

PLAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .50	RATIO 2 1.00
HYDROGRAPH AT	1	7.70 (19.94)	1	4961. (140.47)(	9922. 280.95)(
ROUTED TO	2	7.70 (19.94)	1	4394. (124.43)(	9405. 266.33)(
ROUTED TO	3	7.70 (19.94)	1	4383. (124.12)(	9422. 266.81)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1707.00	1707.00	1710.00
STORAGE	2127.	2127.	2630.
OUTFLOW	0.	0.	828.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.50	1712.18	2.18	3109.	4394.	15.00	45.00	0.00
1.00	1714.06	4.06	3524.	9405.	19.00	45.00	0.00

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.50	4383.	1565.5	46.00
1.00	9422.	1571.0	45.00

```
**********************************
FLO D HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  25 SEP 78
**********************************
    1              A1  IRVING POND DAM NY 174 MOHAWK
    2              A2  HYDRAULIC/HYDROLOGIC ANALYSIS OF IRVING POND DAM
    3              A3  RATIOS OF PMF ROUTED THROUGH THE RESERVOIR AND DOWNSTREAM
    4              B    100       1       0       0       0       0       0       0       0       0
    5              B1     5
    6              J      1       2       1
    7              J1    .5       1
    8              K      0       1       0       0       0       0       1
    9              K1  CALCULATION INFLOW HYDROGRAPH TO IRVING POND
   10              M      1       1     7.7       0     7.7       0       0       0       1
   11              P      0    19.3     111     123     133     142       0       0
   12              T      0       0       0       0       0       0       1     0.1       0
   13              W   4.55    .625       0
   14              X   15.4    15.4       1
   15              K      1       2                                       1
   16              K1  ROUTED FLOW THROUGH IRVING POND
   17              Y                              1       1
   18              Y1     1                                       2127       0
   19              $S  2127    2155    2183    2211    2239    2267    2295    2337    2630    3730
   20              $E  1707  1707.2  1707.4  1707.6  1707.8  1708.0  1708.2  1708.5    1710    1715
   21              $$  1707      59     2.7     1.5
   22              $D  1710     2.7     1.5     290
   23              $8    10     1.5    1690      .5    1707    1711
   24              K      1       3       0       0       0       0       1
   25              K1  CHANNEL ROUTING MOD-PULS REACH 2-3
   26              Y                              1       1
   27              Y1     1
   28              Y6   .04     .05     .04  1555.5    1580    3600   .0357
   29              Y7     0    1571     100    1570     110  1568.5     112  1555.5     135  1555.5
   30              Y7   137  1568.5     147    1570     250    1571
   31              K     99
```

DAM BREAK ANALYSES

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
ROUTE HYDROGRAPH TO	3
END OF NETWORK	

```
**********************************
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION       JULY 1978
  LAST MODIFICATION  25 SEP 78
**********************************

RUN  DATED 04/10/79
     TIMED 16.30.13.


                    IRVING POND DAM NY 174 MOHAWK
                    HYDRAULIC/HYDROLOGIC ANALYSIS OF IRVING POND DAM
                    RATIOS OF PMF ROUTED THROUGH THE RESERVOIR AND DOWNSTREAM

                                        JOB SPECIFICATION
          NO      NHR     NMIN     IDAY      IHR     IMIN    METRC     IPLT     IPRT    NSTAN
         100        1        0        0        0        0        0        0        0        0
                                   JOPER      NWT    LROPT    TRACE
                                       5        0        0        0


                                MULTI-PLAN ANALYSES TO BE PERFORMED
                                    NPLAN= 1 NRTIO= 2 LRTIO= 1
                    RTIOS=     .50    1.00

**********          **********          **********          **********          **********

                                        SUB-AREA RUNOFF COMPUTATION

                    CALCULATION INFLOW HYDROGRAPH TO IRVING POND

                                   ISTAQ    ICOMP    IECON    ITAPE     JPLT     JPRT    INAME   ISTAGE    IAUTO
                                       1        0        0        0        0        0        1        0        0

                                                HYDROGRAPH DATA
                         IHYDG     IUHG    TAREA     SNAP    TRSDA    TRSPC    RATIO    ISNOW    ISAME    LOCAL
                             1        1     7.70     0.00     7.70     0.00    0.000        0        1        0

                                                PRECIP DATA
                                    SPFE      PMS       R6      R12      R24      R48      R72      R96
                                    0.00    19.30   111.00   123.00   133.00   142.00     0.00     0.00
TRSPC COMPUTED BY THE PROGRAM IS  .800

                                                LOSS DATA
                         LROPT   STRKR    DLTKR    RTIOL    ERAIN    STRKS    RTIOK    STRTL    CNSTL    ALSMX    RTIMP
                             0    0.00     0.00     1.00     0.00     0.00     1.00     1.00      .10     0.00     0.00

                                                UNIT HYDROGRAPH DATA
                                            TP=  4.55    CP= .63    NTA=  0

                                                RECESSION DATA
                                        STRTQ=    15.40    QRCSN=    15.40    RTIOR= 1.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 5.23 AND R= 4.22 INTERVALS

                    UNIT HYDROGRAPH 26 END-OF-PERIOD ORDINATES, LAG=   4.54 HOURS, CP=  .63  VOL= 1.00
                  62.      225.      434.      608.      679.      620.      495.      390.      308.      242.
                 191.      151.      119.       94.       74.       58.       46.       36.       28.       22.
                  18.       14.       11.        9.        7.        5.

          0                                     END-OF-PERIOD FLOW
```

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	1.00	1	.01	0.00	.01	15.	1.03	3.00	51	0.00	0.00	0.00	2661.
1.01	2.00	2	.01	0.00	.01	15.	1.03	4.00	52	0.00	0.00	0.00	2116.
1.01	3.00	3	.01	0.00	.01	15.	1.03	5.00	53	0.00	0.00	0.00	1676.
1.01	4.00	4	.01	0.00	.01	15.	1.03	6.00	54	0.00	0.00	0.00	1325.
1.01	5.00	5	.01	0.00	.01	15.	1.03	7.00	55	0.00	0.00	0.00	1047.
1.01	6.00	6	.01	0.00	.01	15.	1.03	8.00	56	0.00	0.00	0.00	829.
1.01	7.00	7	.02	0.00	.02	15.	1.03	9.00	57	0.00	0.00	0.00	655.
1.01	8.00	8	.02	0.00	.02	15.	1.03	10.00	58	0.00	0.00	0.00	519.
1.01	9.00	9	.02	0.00	.02	15.	1.03	11.00	59	0.00	0.00	0.00	411.
1.01	10.00	10	.02	0.00	.02	15.	1.03	12.00	60	0.00	0.00	0.00	327.
1.01	11.00	11	.02	0.00	.02	15.	1.03	13.00	61	0.00	0.00	0.00	260.
1.01	12.00	12	.02	0.00	.02	15.	1.03	14.00	62	0.00	0.00	0.00	207.
1.01	13.00	13	.12	0.00	.12	15.	1.03	15.00	63	0.00	0.00	0.00	160.
1.01	14.00	14	.14	0.00	.14	15.	1.03	16.00	64	0.00	0.00	0.00	121.
1.01	15.00	15	.17	0.00	.17	15.	1.03	17.00	65	0.00	0.00	0.00	88.
1.01	16.00	16	.44	.03	.41	17.	1.03	18.00	66	0.00	0.00	0.00	45.
1.01	17.00	17	.16	.06	.10	26.	1.03	19.00	67	0.00	0.00	0.00	29.
1.01	18.00	18	.13	.03	.10	44.	1.03	20.00	68	0.00	0.00	0.00	19.
1.01	19.00	19	.01	0.00	.01	66.	1.03	21.00	69	0.00	0.00	0.00	18.
1.01	20.00	20	.01	0.00	.01	85.	1.03	22.00	70	0.00	0.00	0.00	17.
1.01	21.00	21	.01	0.00	.01	92.	1.03	23.00	71	0.00	0.00	0.00	17.
1.01	22.00	22	.01	0.00	.01	87.	1.04	0.00	72	0.00	0.00	0.00	16.
1.01	23.00	23	.01	0.00	.01	75.	1.04	1.00	73	0.00	0.00	0.00	16.
1.02	0.00	24	.01	0.00	.01	62.	1.04	2.00	74	0.00	0.00	0.00	15.
1.02	1.00	25	.10	.00	.10	52.	1.04	3.00	75	0.00	0.00	0.00	15.
1.02	2.00	26	.10	.00	.10	45.	1.04	4.00	76	0.00	0.00	0.00	15.
1.02	3.00	27	.10	.00	.10	40.	1.04	5.00	77	0.00	0.00	0.00	15.
1.02	4.00	28	.10	.00	.10	37.	1.04	6.00	78	0.00	0.00	0.00	15.
1.02	5.00	29	.10	.00	.10	36.	1.04	7.00	79	0.00	0.00	0.00	15.
1.02	6.00	30	.10	.00	.10	34.	1.04	8.00	80	0.00	0.00	0.00	15.
1.02	7.00	31	.31	.21	.10	46.	1.04	9.00	81	0.00	0.00	0.00	15.
1.02	8.00	32	.31	.21	.10	92.	1.04	10.00	82	0.00	0.00	0.00	15.
1.02	9.00	33	.31	.21	.10	181.	1.04	11.00	83	0.00	0.00	0.00	15.
1.02	10.00	34	.31	.21	.10	305.	1.04	12.00	84	0.00	0.00	0.00	15.
1.02	11.00	35	.31	.21	.10	445.	1.04	13.00	85	0.00	0.00	0.00	15.
1.02	12.00	36	.31	.21	.10	572.	1.04	14.00	86	0.00	0.00	0.00	15.
1.02	13.00	37	1.71	1.61	.10	761.	1.04	15.00	87	0.00	0.00	0.00	15.
1.02	14.00	38	2.06	1.96	.10	1179.	1.04	16.00	88	0.00	0.00	0.00	15.
1.02	15.00	39	2.57	2.47	.10	1962.	1.04	17.00	89	0.00	0.00	0.00	15.
1.02	16.00	40	6.51	6.41	.10	3376.	1.04	18.00	90	0.00	0.00	0.00	15.
1.02	17.00	41	2.40	2.30	.10	5432.	1.04	19.00	91	0.00	0.00	0.00	15.
1.02	18.00	42	1.89	1.79	.10	7634.	1.04	20.00	92	0.00	0.00	0.00	15.
1.02	19.00	43	.15	.05	.10	9301.	1.04	21.00	93	0.00	0.00	0.00	15.
1.02	20.00	44	.15	.05	.10	9922.	1.04	22.00	94	0.00	0.00	0.00	15.
1.02	21.00	45	.15	.05	.10	9343.	1.04	23.00	95	0.00	0.00	0.00	15.
1.02	22.00	46	.15	.05	.10	8004.	1.05	0.00	96	0.00	0.00	0.00	15.
1.02	23.00	47	.15	.05	.10	6530.	1.05	1.00	97	0.00	0.00	0.00	15.
1.03	0.00	48	.15	.05	.10	5219.	1.05	2.00	98	0.00	0.00	0.00	15.
1.03	1.00	49	0.00	0.00	0.00	4170.	1.05	3.00	99	0.00	0.00	0.00	15.
1.03	2.00	50	0.00	0.00	0.00	3334.	1.05	4.00	100	0.00	0.00	0.00	15.
									SUM	21.92	18.25	3.67	91815.
										(557.)(	464.)(	93.)(	2599.91)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9922.	8364.	3666.	1269.	91817.
CMS	281.	237.	104.	36.	2600.
INCHES		10.10	17.72	18.40	18.49
MM		256.66	450.03	467.45	469.58
AC-FT		4147.	7272.	7554.	7588.
THOUS CU M		5116.	8970.	9317.	9360.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
8.	8.	8.	8.	8.	9.	13.	22.	33.	42.
46.	43.	37.	31.	26.	23.	20.	19.	18.	17.
23.	46.	90.	153.	222.	286.	381.	590.	981.	1688.
2716.	3817.	4650.	4961.	4672.	4002.	3265.	2609.	2085.	1667.
1331.	1058.	838.	662.	524.	414.	328.	259.	206.	163.
130.	104.	80.	60.	44.	23.	15.	9.	9.	9.
8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
8.	8.	8.	8.	8.	8.	8.	8.	8.	8.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4961.	4182.	1833.	635.	45908.
CMS	140.	118.	52.	18.	1300.
INCHES		5.05	8.86	9.20	9.24
MM		128.33	225.02	233.72	234.79
AC-FT		2074.	3636.	3777.	3794.
THOUS CU M		2558.	4485.	4659.	4680.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	17.	26.	44.	66.	85.
92.	87.	75.	62.	52.	45.	40.	37.	36.	34.
46.	92.	181.	305.	445.	572.	761.	1179.	1962.	3376.
5432.	7634.	9301.	9922.	9343.	8004.	6530.	5219.	4170.	3334.
2661.	2116.	1676.	1325.	1047.	829.	655.	519.	411.	327.
260.	207.	160.	121.	88.	45.	29.	19.	18.	17.
17.	16.	16.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.
15.	15.	15.	15.	15.	15.	15.	15.	15.	15.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9922.	8364.	3666.	1269.	91817.
CMS	281.	237.	104.	36.	2600.
INCHES		10.10	17.72	18.40	18.49
MM		256.66	450.03	467.45	469.58
AC-FT		4147.	7272.	7554.	7588.
THOUS CU M		5116.	8970.	9317.	9360.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTED FLOW THROUGH IRVING POND

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	2127.	0

CAPACITY=	2127.	2155.	2183.	2211.	2239.	2267.	2295.	2337.	2630.	3730.

```
                                 CREL    SPWID     COQW     EXPW    ELEVL     COQL    CAREA      EXPL
                               1707.0     59.0      2.7      1.5      0.0      0.0      0.0       0.0

                                                              DAM DATA
                                                    TOPEL     COQD     EXPD  DAMWID
                                                   1710.0      2.7      1.5    290.

                                                          DAM BREACH DATA
                                            BRWID        Z     ELBM    TFAIL     WSEL  FAILEL
                                              10.     1.50  1690.00      .50  1707.00 1711.00

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
            BOTTOM OF RESERVOIR ASSUMED TO BE AT 1707.00
            STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1715.00


                                                   STATION      2, PLAN 1, RATIO 1

BEGIN DAM FAILURE AT 43.00 HOURS

                                                 END-OF-PERIOD HYDROGRAPH ORDINATES

                                                           OUTFLOW
                 0.         0.         0.         0.         1.         1.         1.         1.         1.         1.
                 2.         2.         2.         2.         2.         3.         3.         3.         4.         6.
                 8.         9.        11.        13.        13.        14.        15.        15.        15.        15.
                16.        17.        20.        27.        40.        60.        88.       135.       223.       372.
               623.      1222.      2581.      9928.      7613.      6520.      6520.      6520.      6520.      6520.
              6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
              6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
              6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
              6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
              6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.

                                                           STORAGE
              2128.      2128.      2129.      2129.      2130.      2131.      2131.      2132.      2132.      2133.
              2133.      2134.      2134.      2135.      2135.      2136.      2136.      2138.      2140.      2142.
              2145.      2148.      2151.      2153.      2154.      2155.      2155.      2156.      2156.      2156.
              2157.      2158.      2162.      2170.      2183.      2200.      2221.      2252.      2302.      2388.
              2529.      2723.      2915.      2602.      2276.      2127.      2127.      2127.      2127.      2127.
              2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
              2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
              2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
              2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
              2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.

                                                            STAGE
            1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
            1707.0     1707.0     1707.1     1707.1     1707.1     1707.1     1707.1     1707.1     1707.1     1707.1
            1707.1     1707.2     1707.2     1707.2     1707.2     1707.2     1707.2     1707.2     1707.2     1707.2
            1707.2     1707.2     1707.3     1707.3     1707.4     1707.5     1707.7     1707.9     1708.3     1708.8
            1709.5     1710.4     1711.3     1709.9     1708.1     1707.0     1707.0     1707.0     1707.0     1707.0
            1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
            1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
            1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
            1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
            1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0

PEAK OUTFLOW IS     12472. AT TIME  43.50 HOURS


                                       PEAK    6-HOUR    24-HOUR    72-HOUR   TOTAL VOLUME
                              CFS     9928.     6986.      6637.      5255.        378470.
                              CMS      281.      198.       188.       149.         10717.
                           INCHES                8.44      32.07      76.18          76.20
```

MM	214.38	814.59	1934.96	1935.60
AC-FT	3464.	13163.	31268.	31279.
THOUS CU M	4273.	16237.	38569.	38582.

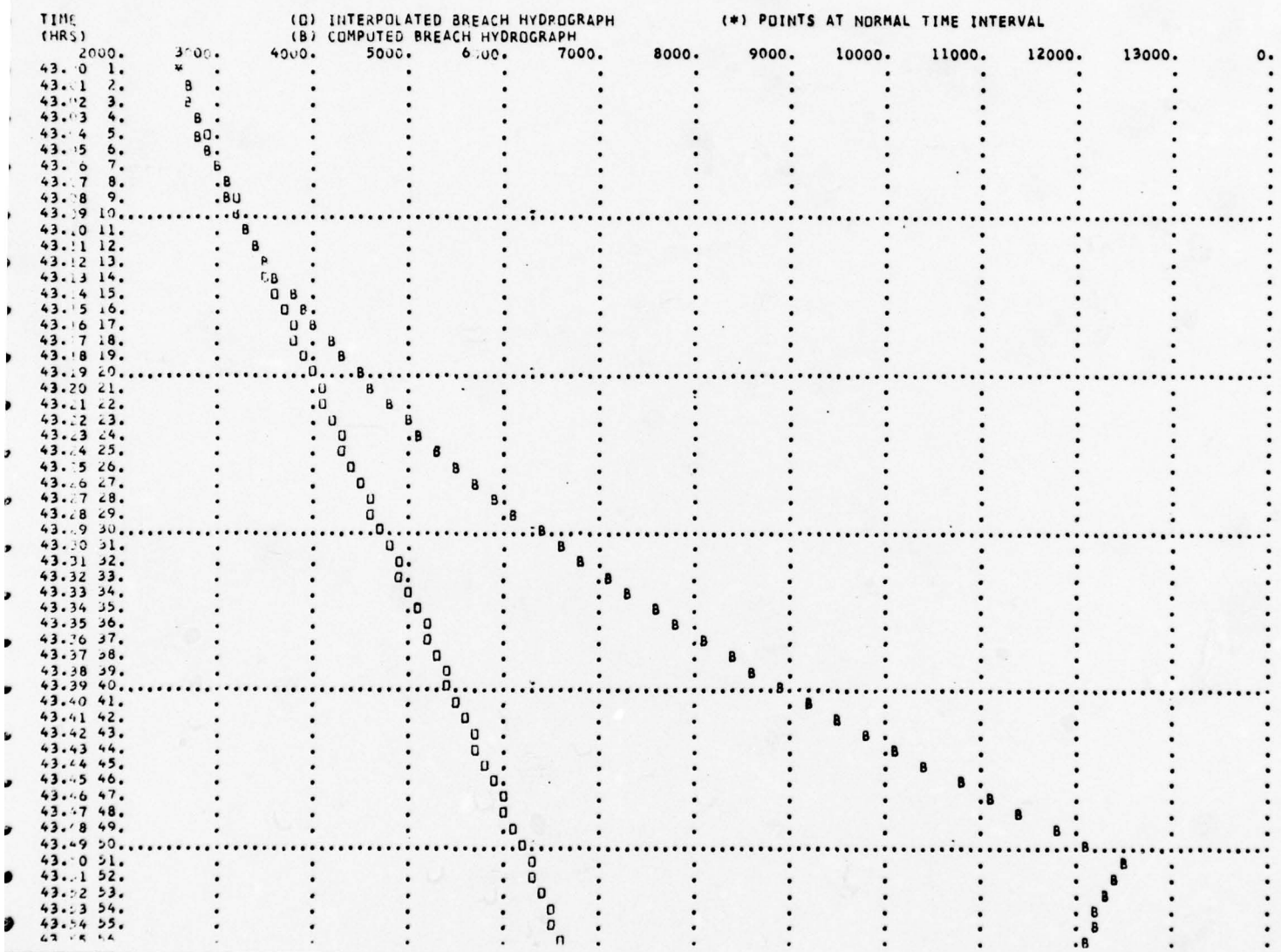
THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF .010 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 1.000 HOURS.
THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

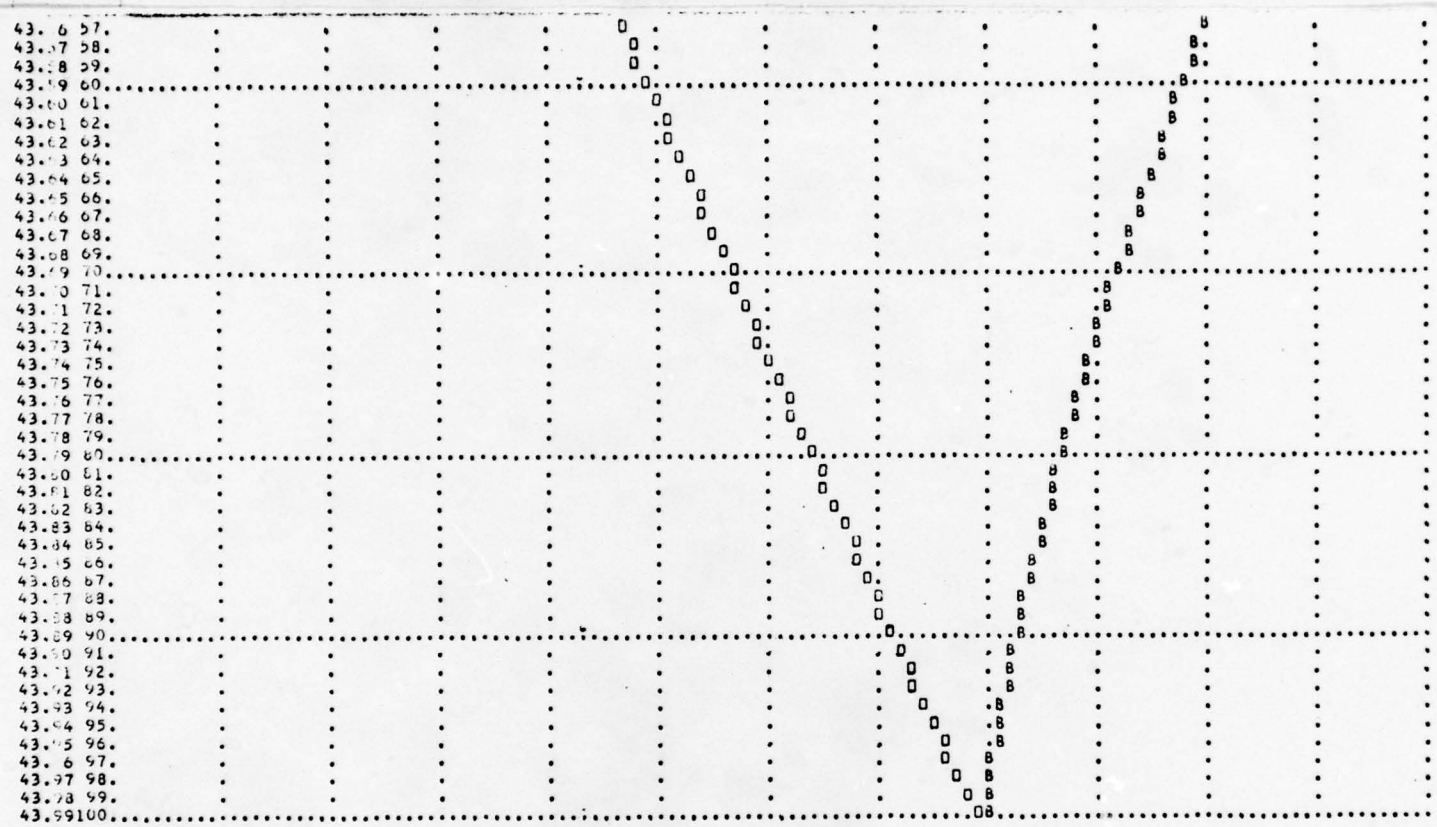
TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	-	COMPUTED BREACH HYDROGRAPH (CFS)	=	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
43.000	0.000	2581.		2581.		0.	0.	0.
43.010	.010	2654.		2672.		-18.	-18.	-0.
43.020	.020	2728.		2721.		6.	-11.	-0.
43.030	.030	2801.		2776.		25.	13.	0.
43.040	.040	2875.		2837.		38.	51.	0.
43.050	.050	2948.		2903.		45.	96.	0.
43.060	.060	3022.		2975.		46.	142.	0.
43.070	.070	3095.		3053.		42.	184.	0.
43.080	.080	3169.		3137.		31.	215.	0.
43.090	.090	3242.		3227.		15.	230.	0.
43.100	.100	3316.		3323.		-7.	223.	0.
43.110	.110	3389.		3425.		-36.	187.	0.
43.120	.120	3463.		3533.		-71.	117.	0.
43.130	.130	3536.		3647.		-111.	5.	0.
43.140	.140	3610.		3768.		-159.	-153.	-0.
43.150	.150	3683.		3895.		-212.	-366.	-0.
43.160	.160	3756.		4029.		-272.	-638.	-1.
43.170	.170	3830.		4169.		-339.	-976.	-1.
43.180	.180	3903.		4315.		-411.	-1388.	-1.
43.190	.190	3977.		4468.		-491.	-1879.	-2.
43.200	.200	4050.		4627.		-577.	-2455.	-2.
43.210	.210	4124.		4793.		-669.	-3125.	-3.
43.220	.220	4197.		4966.		-768.	-3893.	-3.
43.230	.230	4271.		5145.		-874.	-4767.	-4.
43.240	.240	4344.		5331.		-987.	-5754.	-5.
43.250	.250	4418.		5523.		-1106.	-6859.	-6.
43.260	.260	4491.		5722.		-1231.	-8091.	-7.
43.270	.270	4565.		5928.		-1364.	-9454.	-8.
43.280	.280	4638.		6141.		-1503.	-10957.	-9.
43.290	.290	4712.		6360.		-1648.	-12605.	-10.
43.300	.300	4785.		6586.		-1800.	-14405.	-12.
43.310	.310	4859.		6818.		-1959.	-16365.	-14.
43.320	.320	4932.		7057.		-2125.	-18490.	-15.
43.330	.330	5006.		7303.		-2297.	-20787.	-17.
43.340	.340	5079.		7555.		-2476.	-23263.	-19.
43.350	.350	5153.		7814.		-2661.	-25924.	-21.
43.360	.360	5226.		8079.		-2853.	-28777.	-24.
43.370	.370	5299.		8351.		-3052.	-31829.	-26.
43.380	.380	5373.		8630.		-3257.	-35086.	-29.
43.390	.390	5446.		8915.		-3468.	-38554.	-32.
43.400	.400	5520.		9206.		-3686.	-42241.	-35.
43.410	.410	5593.		9504.		-3911.	-46152.	-38.
43.420	.420	5667.		9809.		-4142.	-50293.	-42.
43.430	.430	5740.		10119.		-4379.	-54672.	-45.
43.440	.440	5814.		10437.		-4623.	-59295.	-49.
43.450	.450	5887.		10760.		-4873.	-64168.	-53.
43.460	.460	5961.		11090.		-5129.	-69297.	-57.
43.470	.470	6034.		11426.		-5392.	-74689.	-62.
43.480	.480	6108.		11768.		-5661.	-80349.	-66.
43.490	.490	6181.		12117.		-5936.	-86285.	-71.
43.500	.500	6255.		12472.		-6217.	-92502.	-76.
43.510	.510	6328.		12393.		-6065.	-98567.	-81.
43.520	.520	6402.		12316.		-5914.	-104481.	-86.

43.530	.530	6475.	12240.	-5765.	-110246.	-91.
43.540	.540	6549.	12165.	-5617.	-115863.	-96.
43.550	.550	6622.	12092.	-5470.	-121333.	-100.
43.560	.560	6695.	12020.	-5325.	-126658.	-105.
43.570	.570	6769.	11950.	-5181.	-131838.	-109.
43.580	.580	6842.	11880.	-5038.	-136876.	-113.
43.590	.590	6916.	11812.	-4896.	-141773.	-117.
43.600	.600	6989.	11745.	-4756.	-146529.	-121.
43.610	.610	7063.	11680.	-4617.	-151145.	-125.
43.620	.620	7136.	11615.	-4479.	-155624.	-129.
43.630	.630	7210.	11552.	-4342.	-159967.	-132.
43.640	.640	7283.	11490.	-4207.	-164173.	-136.
43.650	.650	7357.	11429.	-4072.	-168245.	-139.
43.660	.660	7430.	11369.	-3939.	-172184.	-142.
43.670	.670	7504.	11310.	-3807.	-175991.	-145.
43.680	.680	7577.	11253.	-3675.	-179666.	-148.
43.690	.690	7651.	11196.	-3545.	-183211.	-151.
43.700	.700	7724.	11140.	-3416.	-186628.	-154.
43.710	.710	7798.	11086.	-3288.	-189916.	-157.
43.720	.720	7871.	11032.	-3161.	-193077.	-160.
43.730	.730	7945.	10980.	-3035.	-196113.	-162.
43.740	.740	8018.	10929.	-2911.	-199023.	-164.
43.750	.750	8092.	10878.	-2787.	-201810.	-167.
43.760	.760	8165.	10829.	-2664.	-204474.	-169.
43.770	.770	8238.	10780.	-2542.	-207015.	-171.
43.780	.780	8312.	10733.	-2421.	-209436.	-173.
43.790	.790	8385.	10686.	-2301.	-211737.	-175.
43.800	.800	8459.	10641.	-2182.	-213919.	-177.
43.810	.810	8532.	10596.	-2064.	-215982.	-178.
43.820	.820	8606.	10552.	-1947.	-217929.	-180.
43.830	.830	8679.	10510.	-1830.	-219759.	-182.
43.840	.840	8753.	10468.	-1715.	-221474.	-183.
43.850	.850	8826.	10427.	-1601.	-223075.	-184.
43.860	.860	8900.	10388.	-1488.	-224563.	-186.
43.870	.870	8973.	10349.	-1376.	-225939.	-187.
43.880	.880	9047.	10311.	-1264.	-227203.	-188.
43.890	.890	9120.	10274.	-1154.	-228357.	-189.
43.900	.900	9194.	10239.	-1045.	-229403.	-190.
43.910	.910	9267.	10205.	-938.	-230340.	-190.
43.920	.920	9341.	10172.	-831.	-231171.	-191.
43.930	.930	9414.	10141.	-726.	-231898.	-192.
43.940	.940	9488.	10110.	-623.	-232520.	-192.
43.950	.950	9561.	10079.	-518.	-233039.	-193.
43.960	.960	9635.	10049.	-414.	-233453.	-193.
43.970	.970	9708.	10018.	-310.	-233763.	-193.
43.980	.980	9781.	9988.	-207.	-233969.	-193.
43.990	.990	9855.	9958.	-103.	-234072.	-193.
44.000	1.000	9928.	9928.	0.	-234072.	-193.

OVF

STATION 2




43. 6 57.
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43. 6 97.
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43.99100

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*OVN*

WARNING *** TOP OF DAM, BOTTOM OF BREACH, OR LOW-LEVEL OUTLET IS NOT WITHIN RANGE OF GIVEN ELEVATIONS IN STORAGE-ELEVATION DATA
            BOTTOM OF RESERVOIR ASSUMED TO BE AT 1707.00
            STORAGE-ELEVATION DATA WILL BE EXTRAPOLATED ABOVE ELEVATION 1715.00

                                                  STATION      2, PLAN 1, RATIO 2

BEGIN DAM FAILURE AT 41.00 HOURS

                                                END-OF-PERIOD HYDROGRAPH ORDINATES

                                                           OUTFLOW
               0.         0.         1.         1.         1.         2.         2.         3.         3.         4.
               4.         5.         5.         6.         6.         6.         7.         9.        11.        15.
              20.        25.        29.        32.        34.        35.        36.        36.        36.        36.
              36.        39.        48.        66.        99.       149.       220.       325.       486.       810.
            2 57.     10582.      9562.      9584.      9606.      9188.      8360.      7155.      6520.      6520.
            6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
            6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
            6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
            6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.
            6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.      6520.

                                                           STORAGE
            2128.      2130.      2131.      2132.      2133.      2134.      2135.      2136.      2137.      2138.
            2139.      2140.      2141.      2142.      2143.      2144.      2145.      2147.      2151.      2156.
            2162.      2167.      2172.      2175.      2177.      2178.      2179.      2179.      2179.      2179.
            2179.      2182.      2190.      2205.      2229.      2261.      2301.      2358.      2455.      2622.
            2363.      2684.      2551.      2555.      2556.      2498.      2373.      2218.      2127.      2127.
            2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
            2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
            2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
            2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.
            2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.      2127.

                                                            STAGE
          1707.0     1707.0     1707.0     1707.0     1707.0     1707.1     1707.1     1707.1     1707.1     1707.1
          1707.1     1707.1     1707.1     1707.1     1707.1     1707.1     1707.1     1707.1     1707.2     1707.2
          1707.2     1707.3     1707.3     1707.3     1707.4     1707.4     1707.4     1707.4     1707.4     1707.4
          1707.4     1707.4     1707.4     1707.6     1707.7     1708.0     1708.2     1708.6     1709.1     1710.0
          1711.1     1710.2     1709.6     1709.6     1709.6     1709.3     1708.7     1707.6     1707.0     1707.0
          1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
          1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
          1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
          1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0
          1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0     1707.0

PEAK OUTFLOW IS     12582. AT TIME  41.50 HOURS


                                        PEAK    6-HOUR   24-HOUR   72-HOUR   TOTAL VOLUME
                                CFS   10582.     9195.     7202.     5616.       404663.
                                CMS     300.      260.      204.      159.        11459.
                             INCHES              11.11     34.80     81.41         81.48
                                 MM             282.14    883.98   2067.92       2069.55
                              AC-FT              4559.    14285.    33417.        33443.
                         THOUS CU M              5624.    17620.    41219.        41252.
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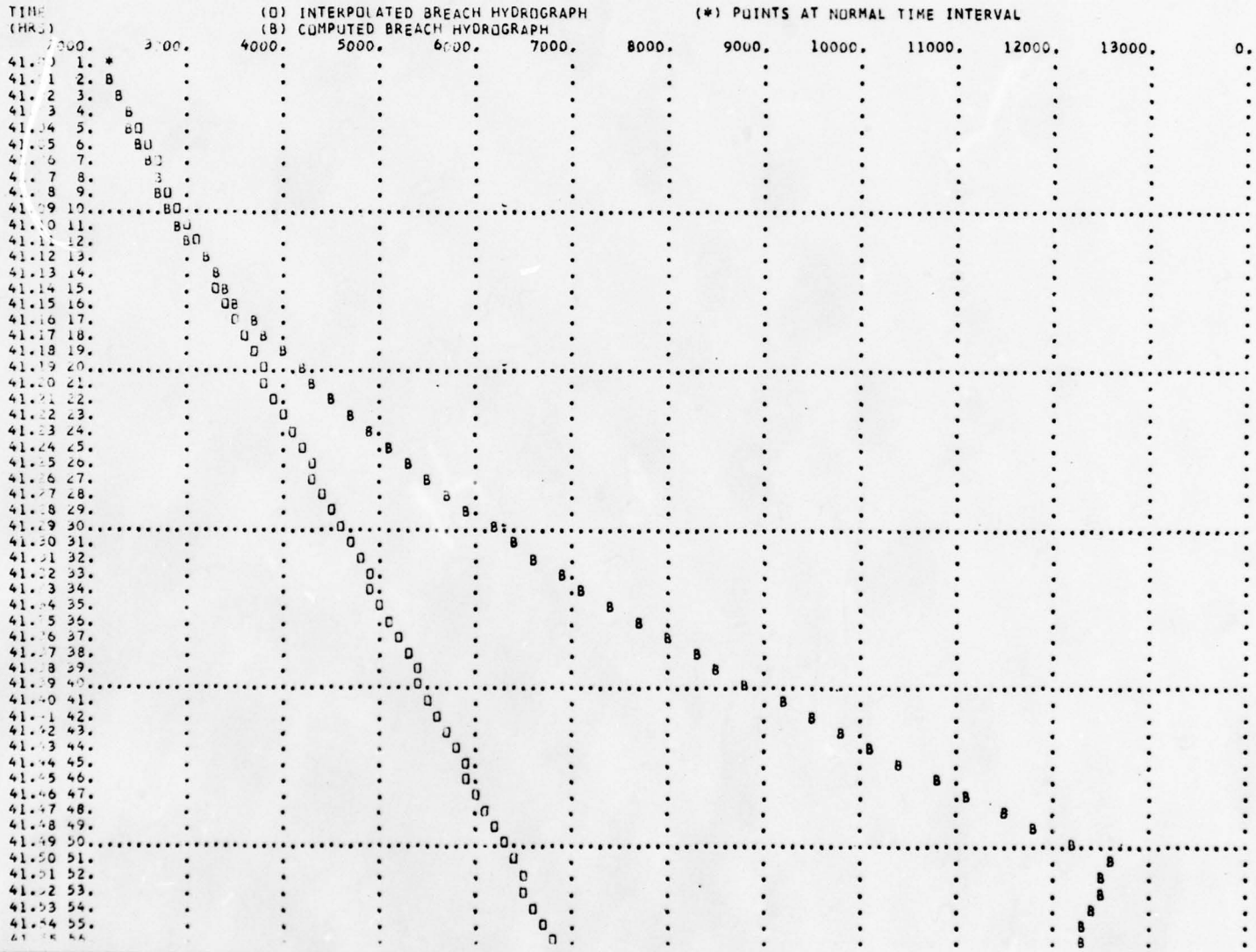
THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF .010 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF 1.000 HOURS.
THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

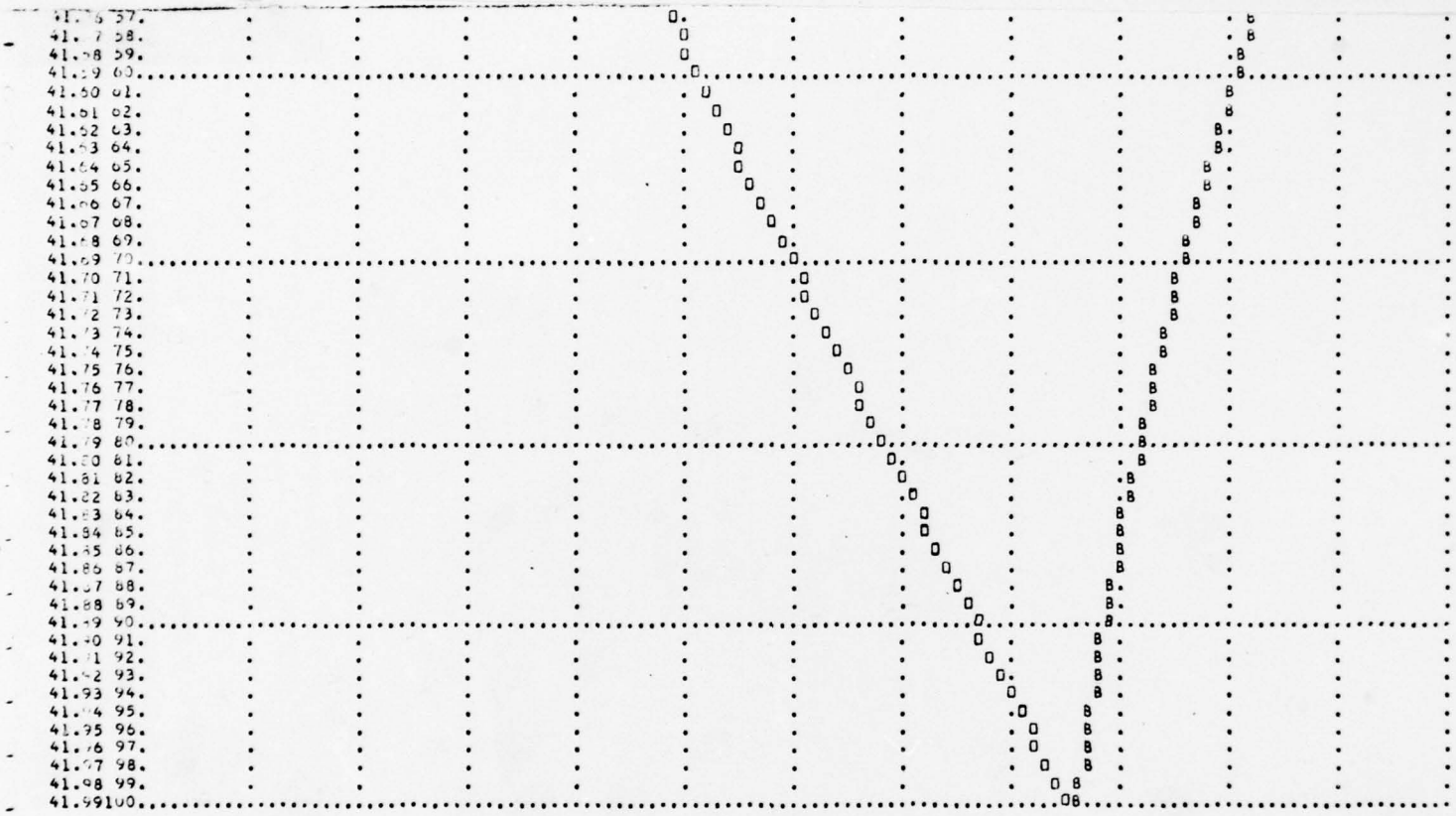
TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	-	COMPUTED BREACH HYDROGRAPH (CFS)	=	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
41.000	0.000	2157.		2157.		0.	0.	0.
41.010	.010	2241.		2242.		-1.	-1.	-0.
41.020	.020	2326.		2295.		30.	30.	0.
41.030	.030	2410.		2354.		55.	85.	0.
41.040	.040	2494.		2419.		75.	160.	0.
41.050	.050	2578.		2490.		88.	248.	0.
41.060	.060	2663.		2568.		95.	343.	0.
41.070	.070	2747.		2651.		96.	439.	0.
41.080	.080	2831.		2740.		91.	529.	0.
41.090	.090	2915.		2836.		79.	609.	1.
41.100	.100	3000.		2938.		62.	670.	1.
41.110	.110	3084.		3046.		37.	708.	1.
41.120	.120	3168.		3161.		7.	714.	1.
41.130	.130	3252.		3283.		-30.	684.	1.
41.140	.140	3337.		3411.		-74.	610.	1.
41.150	.150	3421.		3546.		-125.	485.	0.
41.160	.160	3505.		3687.		-182.	303.	0.
41.170	.170	3589.		3835.		-246.	57.	0.
41.180	.180	3674.		3990.		-317.	-259.	-0.
41.190	.190	3758.		4152.		-394.	-653.	-1.
41.200	.200	3842.		4321.		-479.	-1132.	-1.
41.210	.210	3926.		4496.		-570.	-1702.	-1.
41.220	.220	4011.		4679.		-668.	-2370.	-2.
41.230	.230	4095.		4868.		-773.	-3143.	-3.
41.240	.240	4179.		5065.		-886.	-4029.	-3.
41.250	.250	4263.		5268.		-1005.	-5033.	-4.
41.260	.260	4348.		5478.		-1131.	-6164.	-5.
41.270	.270	4432.		5696.		-1264.	-7428.	-6.
41.280	.280	4516.		5920.		-1404.	-8832.	-7.
41.290	.290	4600.		6151.		-1551.	-10383.	-9.
41.300	.300	4685.		6390.		-1705.	-12088.	-10.
41.310	.310	4769.		6635.		-1866.	-13954.	-12.
41.320	.320	4853.		6887.		-2034.	-15988.	-13.
41.330	.330	4937.		7146.		-2209.	-18197.	-15.
41.340	.340	5022.		7412.		-2391.	-20588.	-17.
41.350	.350	5106.		7685.		-2579.	-23167.	-19.
41.360	.360	5190.		7965.		-2775.	-25942.	-21.
41.370	.370	5274.		8251.		-2977.	-28919.	-24.
41.380	.380	5359.		8545.		-3186.	-32105.	-27.
41.390	.390	5443.		8845.		-3402.	-35507.	-29.
41.400	.400	5527.		9152.		-3625.	-39132.	-32.
41.410	.410	5611.		9465.		-3854.	-42986.	-36.
41.420	.420	5696.		9786.		-4090.	-47076.	-39.
41.430	.430	5780.		10112.		-4332.	-51408.	-42.
41.440	.440	5864.		10446.		-4582.	-55990.	-46.
41.450	.450	5948.		10786.		-4837.	-60827.	-50.
41.460	.460	6033.		11132.		-5099.	-65927.	-54.
41.470	.470	6117.		11485.		-5368.	-71295.	-59.
41.480	.480	6201.		11844.		-5643.	-76938.	-64.
41.490	.490	6285.		12210.		-5925.	-82863.	-68.
41.500	.500	6370.		12582.		-6212.	-89075.	-74.
41.510	.510	6454.		12519.		-6065.	-95140.	-79.
41.520	.520	6538.		12458.		-5920.	-101060.	-84.

41.530	.530	6622.	12378.	-5775.	-106835.	-88.
41.540	.540	6707.	12339.	-5632.	-112467.	-93.
41.550	.550	6791.	12281.	-5490.	-117957.	-97.
41.560	.560	6875.	12224.	-5349.	-123305.	-102.
41.570	.570	6959.	12168.	-5209.	-128514.	-106.
41.580	.580	7044.	12114.	-5070.	-133584.	-110.
41.590	.590	7128.	12060.	-4932.	-138516.	-114.
41.600	.600	7212.	12008.	-4795.	-143311.	-118.
41.610	.610	7296.	11956.	-4660.	-147971.	-122.
41.620	.620	7381.	11906.	-4525.	-152496.	-126.
41.630	.630	7465.	11856.	-4391.	-156887.	-130.
41.640	.640	7549.	11808.	-4259.	-161145.	-133.
41.650	.650	7634.	11760.	-4127.	-165272.	-137.
41.660	.660	7718.	11714.	-3996.	-169268.	-140.
41.670	.670	7802.	11668.	-3866.	-173134.	-143.
41.680	.680	7886.	11623.	-3737.	-176871.	-146.
41.690	.690	7971.	11579.	-3609.	-180480.	-149.
41.700	.700	8055.	11536.	-3482.	-183962.	-152.
41.710	.710	8139.	11494.	-3355.	-187317.	-155.
41.720	.720	8223.	11453.	-3230.	-190547.	-157.
41.730	.730	8308.	11413.	-3105.	-193652.	-160.
41.740	.740	8392.	11373.	-2981.	-196633.	-163.
41.750	.750	8476.	11334.	-2858.	-199491.	-165.
41.760	.760	8560.	11296.	-2736.	-202226.	-167.
41.770	.770	8545.	11258.	-2614.	-204840.	-169.
41.780	.780	8729.	11222.	-2493.	-207333.	-171.
41.790	.790	8813.	11186.	-2373.	-209706.	-173.
41.800	.800	8897.	11151.	-2254.	-211960.	-175.
41.810	.810	8982.	11116.	-2135.	-214095.	-177.
41.820	.820	9066.	11083.	-2017.	-216112.	-179.
41.830	.830	9150.	11050.	-1900.	-218011.	-180.
41.840	.840	9234.	11017.	-1783.	-219795.	-182.
41.850	.850	9319.	10986.	-1667.	-221462.	-183.
41.860	.860	9403.	10955.	-1552.	-223013.	-184.
41.870	.870	9487.	10924.	-1437.	-224450.	-185.
41.880	.880	9571.	10894.	-1323.	-225773.	-187.
41.890	.890	9656.	10865.	-1210.	-226983.	-188.
41.900	.900	9740.	10837.	-1097.	-228080.	-188.
41.910	.910	9824.	10809.	-985.	-229065.	-189.
41.920	.920	9908.	10781.	-873.	-229937.	-190.
41.930	.930	9993.	10755.	-762.	-230699.	-191.
41.940	.940	10077.	10728.	-651.	-231351.	-191.
41.950	.950	10161.	10703.	-542.	-231892.	-192.
41.960	.960	10245.	10678.	-432.	-232325.	-192.
41.970	.970	10330.	10653.	-323.	-232648.	-192.
41.980	.980	10414.	10629.	-215.	-232863.	-192.
41.990	.990	10498.	10605.	-107.	-232970.	-193.
42.000	1.000	10582.	10582.	0.	-232970.	-193.

OVF

STATION 2





OV1.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

CHANNEL ROUTING MOD-PULS REACH 2-3

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0400	.0500	.0400	1555.5	1580.0	3600.	.03570

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1571.00 100.00 1570.00 110.00 1568.50 112.00 1555.50 135.00 1555.50
137.00 1568.50 147.00 1570.00 250.00 1571.00

STORAGE	0.00	2.47	4.99	7.54	10.14	12.78	15.47	18.19	20.96	23.77
	26.62	30.27	43.18	69.82	96.46	123.10	149.74	176.39	203.03	229.67
OUTFLOW	0.00	186.81	563.89	1059.70	1644.18	2299.96	3015.89	3784.37	4600.00	5458.87
	6358.04	7568.25	9438.56	14596.11	22236.93	31937.07	43475.17	56703.99	71515.28	87824.56
STAGE	1555.50	1556.79	1558.08	1559.37	1560.66	1561.95	1563.24	1564.53	1565.82	1567.11
	1568.39	1569.68	1570.97	1572.26	1573.55	1574.84	1576.13	1577.42	1578.71	1580.00
FLOW	0.00	186.81	563.89	1059.70	1644.18	2299.96	3015.89	3784.37	4600.00	5458.87
	6358.04	7568.25	9438.56	14596.11	22236.93	31937.07	43475.17	56703.99	71515.28	87824.56

STATION 3, PLAN 1, RTIO 1

OUTFLOW

0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
2.	2.	2.	2.	2.	2.	3.	3.	4.	5.
7.	9.	11.	12.	13.	14.	15.	15.	15.	15.
15.	16.	19.	26.	38.	56.	83.	126.	209.	362.
597.	1178.	2493.	9318.	8380.	6004.	6965.	6137.	6850.	6235.
6766.	6308.	6703.	6362.	6657.	6402.	6622.	6432.	6596.	6454.
6677.	6471.	6562.	6483.	6552.	6493.	6544.	6500.	6538.	6505.
6533.	6509.	6530.	6512.	6527.	6514.	6526.	6515.	6524.	6516.
6523.	6517.	6522.	6518.	6522.	6519.	6521.	6519.	6521.	6519.
6521.	6519.	6521.	6520.	6520.	6520.	6520.	6520.	6520.	6520.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	2.	3.	4.
5.	8.	14.	42.	36.	26.	28.	26.	28.	26.
28.	26.	28.	27.	28.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.

STAGE

1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5
1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5
1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6	1555.6
1555.6	1555.6	1555.6	1555.7	1555.8	1555.9	1556.1	1556.4	1556.9	1557.4
1558.2	1559.6	1562.3	1570.9	1570.2	1567.9	1569.0	1568.1	1568.9	1568.2
1568.8	1568.3	1568.8	1568.4	1568.7	1568.4	1568.7	1568.5	1568.6	1568.5
1568.6	1568.5	1568.6	1568.5	1568.6	1568.5	1568.6	1568.5	1568.6	1568.6
1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6
1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6
1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9318.	7019.	6644.	5250.	378142.
CMS	264.	199.	188.	149.	10708.
INCHES		8.48	32.11	76.11	76.14
MM		215.37	815.54	1933 29	1933.92
AC-FT		3480.	13179.	31241.	31251.
THOUS CU M		4293.	16256.	38536.	38548.

MAXIMUM STORAGE = 42.

MAXIMUM STAGE IS 1570.9

STATION 3, PLAN 1, RTIO 2

OUTFLOW

0.	0.	1.	1.	1.	2.	2.	3.	3.	4.
4.	5.	5.	5.	6.	6.	7.	8.	11.	14.
19.	24.	28.	31.	34.	35.	36.	36.	36.	36.
36.	38.	46.	63.	93.	140.	210.	318.	469.	784.
2046.	9878.	10223.	9080.	9982.	8960.	8642.	7088.	6621.	6433.
6595.	6455.	6576.	6471.	6562.	6484.	6551.	6493.	6543.	6500.
6537.	6505.	6533.	6509.	6530.	6512.	6527.	6514.	6525.	6515.
6524.	6517.	6523.	6517.	6522.	6518.	6522.	6519.	6521.	6519.
6521.	6519.	6521.	6519.	6521.	6520.	6520.	6520.	6520.	6520.
6520.	6520.	6520.	6520.	6520.	6520.	6520.	6520.	6520.	6520.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	2.	3.	3.	4.	6.
12.	45.	47.	41.	46.	40.	38.	29.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.
27.	27.	27.	27.	27.	27.	27.	27.	27.	27.

STAGE

1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5
1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.5	1555.6	1555.6	1555.6
1555.6	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7	1555.7

1555.8	1555.8	1555.8	1555.9	1556.1	1556.5	1556.9	1557.2	1557.8	1558.7
1561.4	1571.1	1571.2	1570.7	1571.1	1570.6	1570.4	1569.2	1568.7	1568.5
1568.6	1568.5	1568.6	1568.5	1568.6	1568.5	1568.6	1568.5	1568.6	1568.5
1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6
1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6
1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6
1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6	1568.6

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	10223.	9228.	7211.	5611.	404335.
CMS	289.	261.	204.	159.	11449.
INCHES		11.15	34.85	81.35	81.41
MM		283.17	885.12	2066.27	2067.88
AC-FT		4576.	14303.	33390.	33416.
THOUS CU M		5644.	17643.	41186.	41218.

MAXIMUM STORAGE = 47.

MAXIMUM STAGE IS 1571.2

********** ********** ********** ********** **********

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 .50	 RATIO 2 1.00
HYDROGRAPH AT	1	7.70	1	4961.	9922.
	(	19.94)	(	140.47)(	280.95)(
ROUTED TO	2	7.70	1	9928.	10582.
	(	19.94)	(	281.14)(	299.66)(
ROUTED TO	3	7.70	1	9318.	10223.
	(	19.94)	(	263.86)(	289.49)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1707.00	1707.00	1710.00
STORAGE	2127.	2127.	2630.
OUTFLOW	0.	0.	828.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
.50	1711.39	1.39	2936.	12472.	2.93	43.50	43.00
1.00	1711.28	1.28	2912.	12582.	2.00	41.50	41.00

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.50	9318.	1570.9	44.00
1.00	10223.	1571.2	43.00

LIST OF REFERENCES

APPENDIX E

APPENDIX E

REFERENCES

1) U.S. Department of Commerce, Technical Paper No. 40, Rainfall Frequency Atlas of the United States, May 1961.

2) Soil Conservation Service, National Engineering Handbook, Section 4, Hydrology, August 1972 (U.S. Department of Agriculture).

3) H.W. King and E.F. Brater, Handbook of Hydraulics, 5th edition, McGraw-Hill, 1963.

4) T.W. Lambe and R.V. Whitman, Soil Mechanics, John Wiley and Sons, 1965.

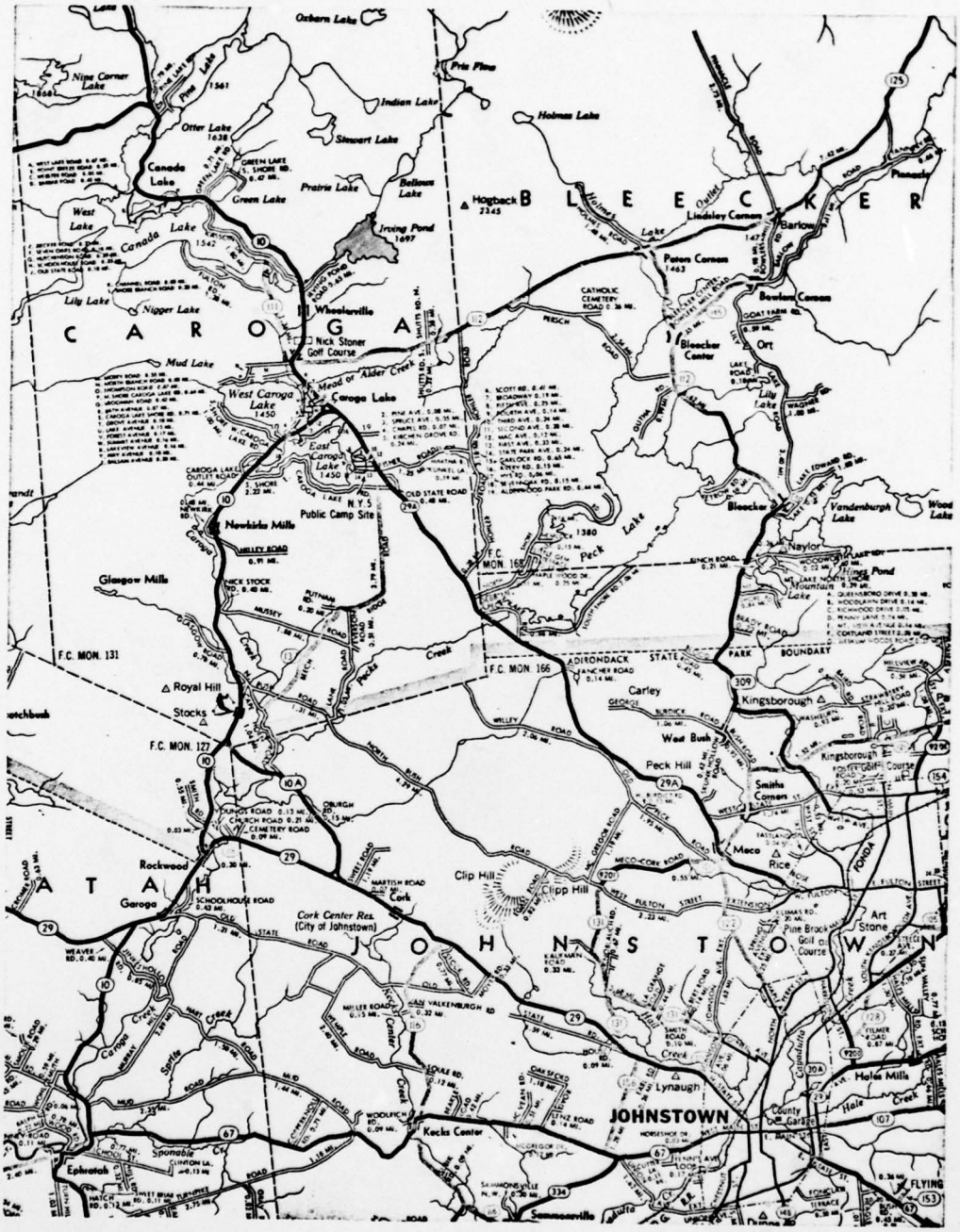
5) W.D. Thornbury, Principles of Geomorphology, John Wiley and Sons, 1969.

6) University of the State of New York, Geology of New York, Education Leaflet 20, Reprinted 1973.

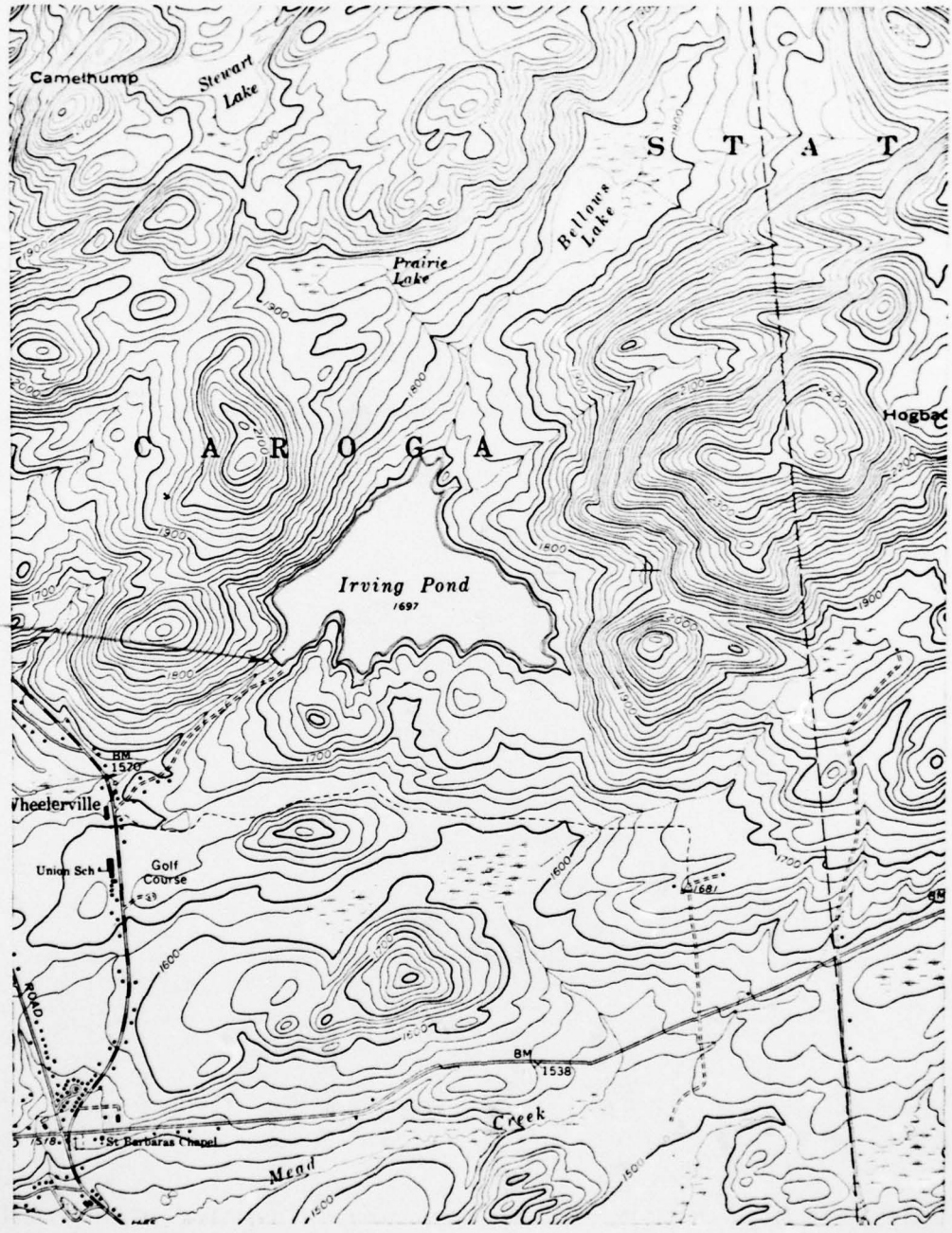
7) Cornell University Agriculture Experiment Station (compiled by M.G. Cline and R.L. Marshall), General Soil Map of New York State and Soils of New York Landscapes, Information Bulletin 119, 1977.

APPENDIX F

DRAWINGS

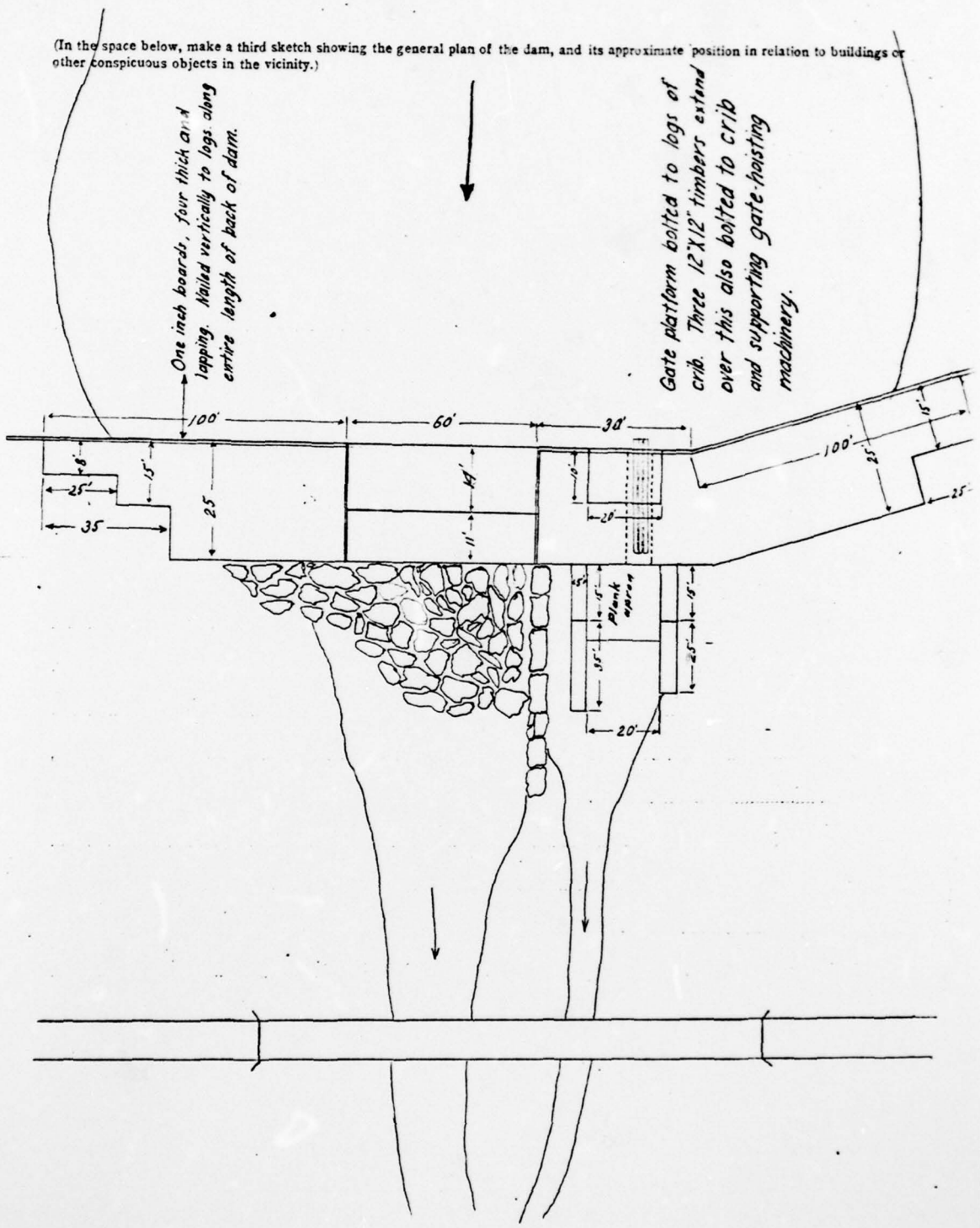


VICINITY MAP

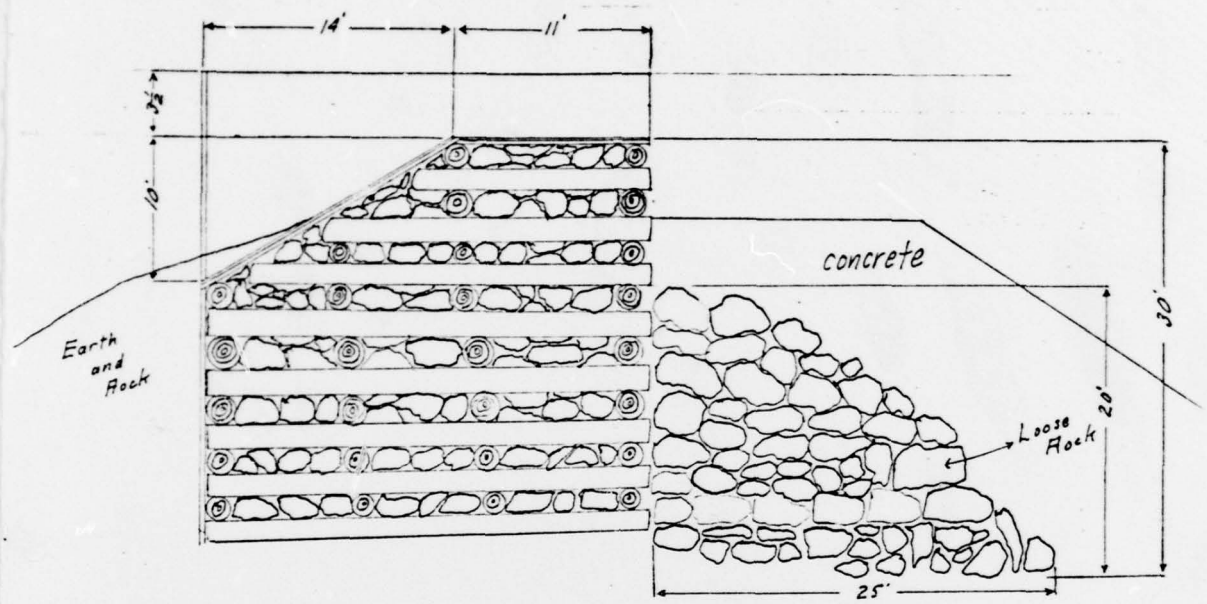


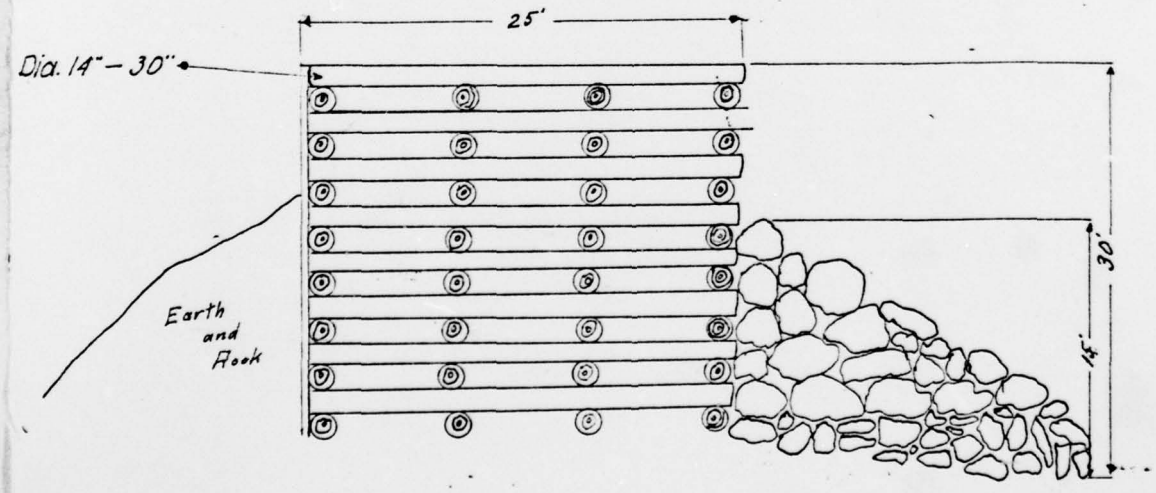
TOPOGRAPHIC MAP

(In the space below, make a third sketch showing the general plan of the dam, and its approximate position in relation to buildings or other conspicuous objects in the vicinity.)

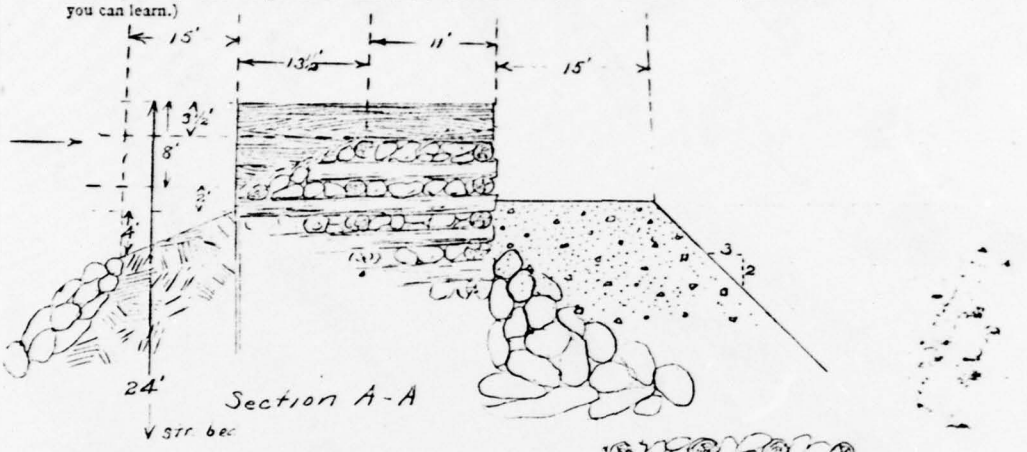


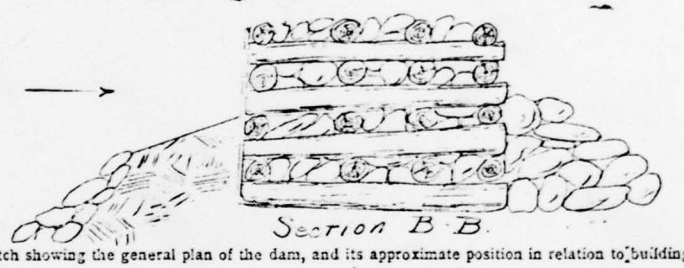
(In the space below, make one sketch showing the form and dimensions of a cross section through the spillway or waste-weir of this dam and outline the abutment, and a second sketch showing the same information for a cross section through the other portion of the dam. Show particularly the greatest height of the dam above the stream bed, its thickness at the top, and thickness at the bottom, as nearly as you can learn.)



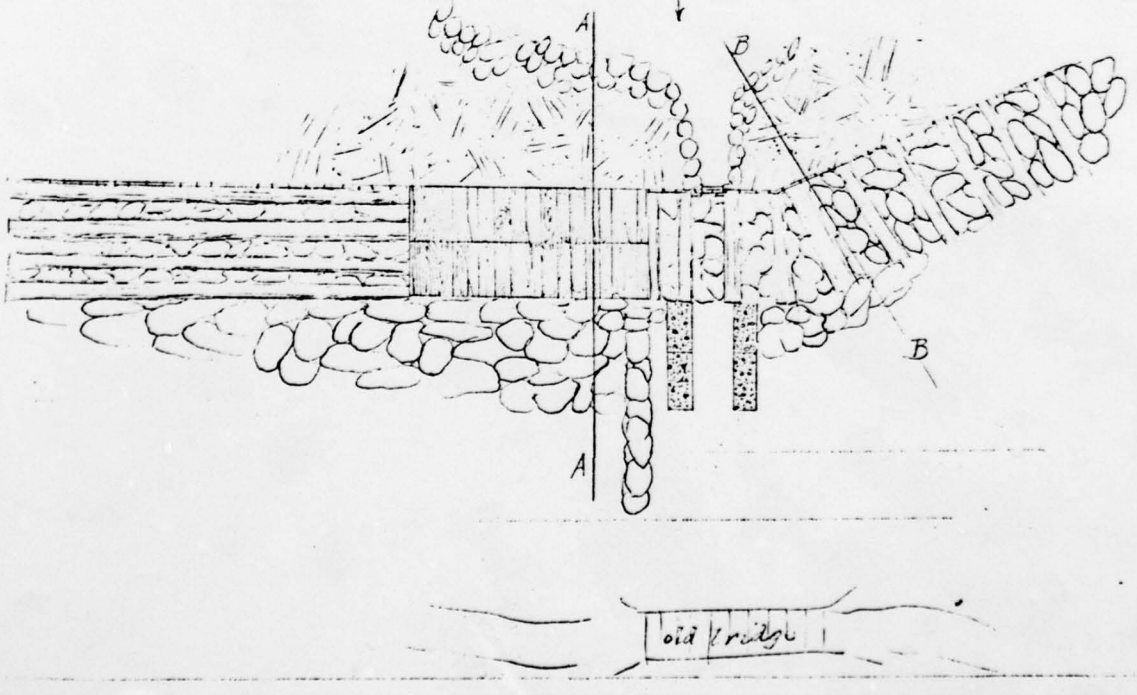


(In the space below, make one sketch shewing the form and dimensions of a cross section through the spillway or waste-weir of this dam, and a second sketch showing the same information for a cross section through the other portion of the dam. Show particularly the greatest height of the dam above the stream bed, its thickness at the top, and thickness at the bottom, as nearly as you can learn.)





(In the space below, make a third sketch showing the general plan of the dam, and its approximate position in relation to buildings or other conspicuous objects in the vicinity.



LIST OF DRAWINGS

1. Plan
2. Topography at Dam Site
3. Timber Crib Spillway Details
4. Sluiceway Details
5. Sluiceway Reconstruction

AD-A078 187 NEW YORK STATE DEPT OF ENVIRONMENTAL CONSERVATION ALBANY F/G 13/13
NATIONAL DAM SAFETY PROGRAM. IRVING POND DAM (INVENTORY NUMBER --ETC(U)
JUN 79 G KOCH DACW51-79-C-0001

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2 OF 2
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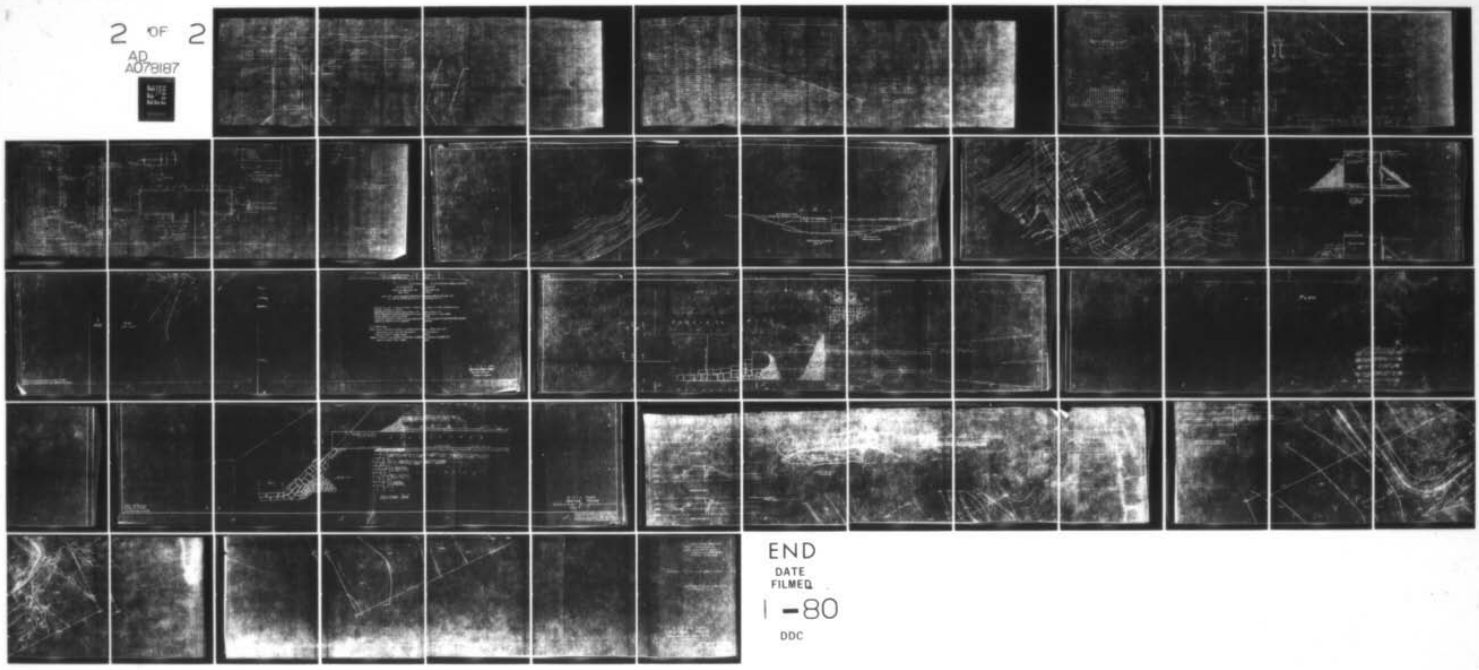

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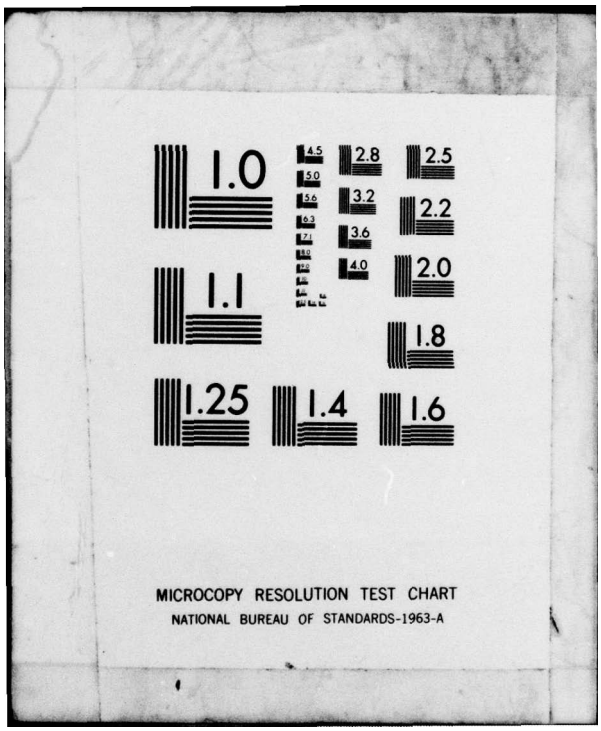
1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
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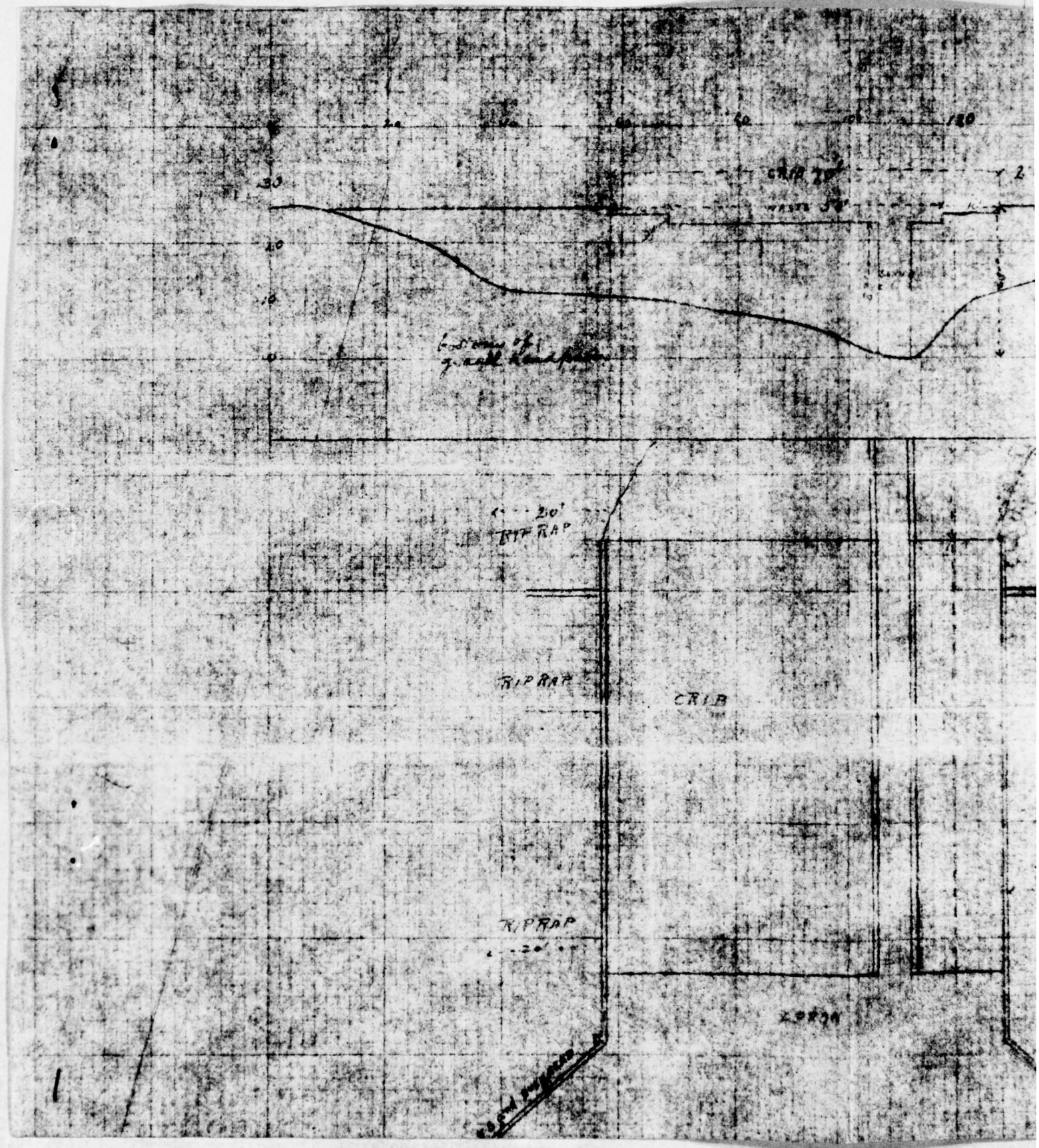
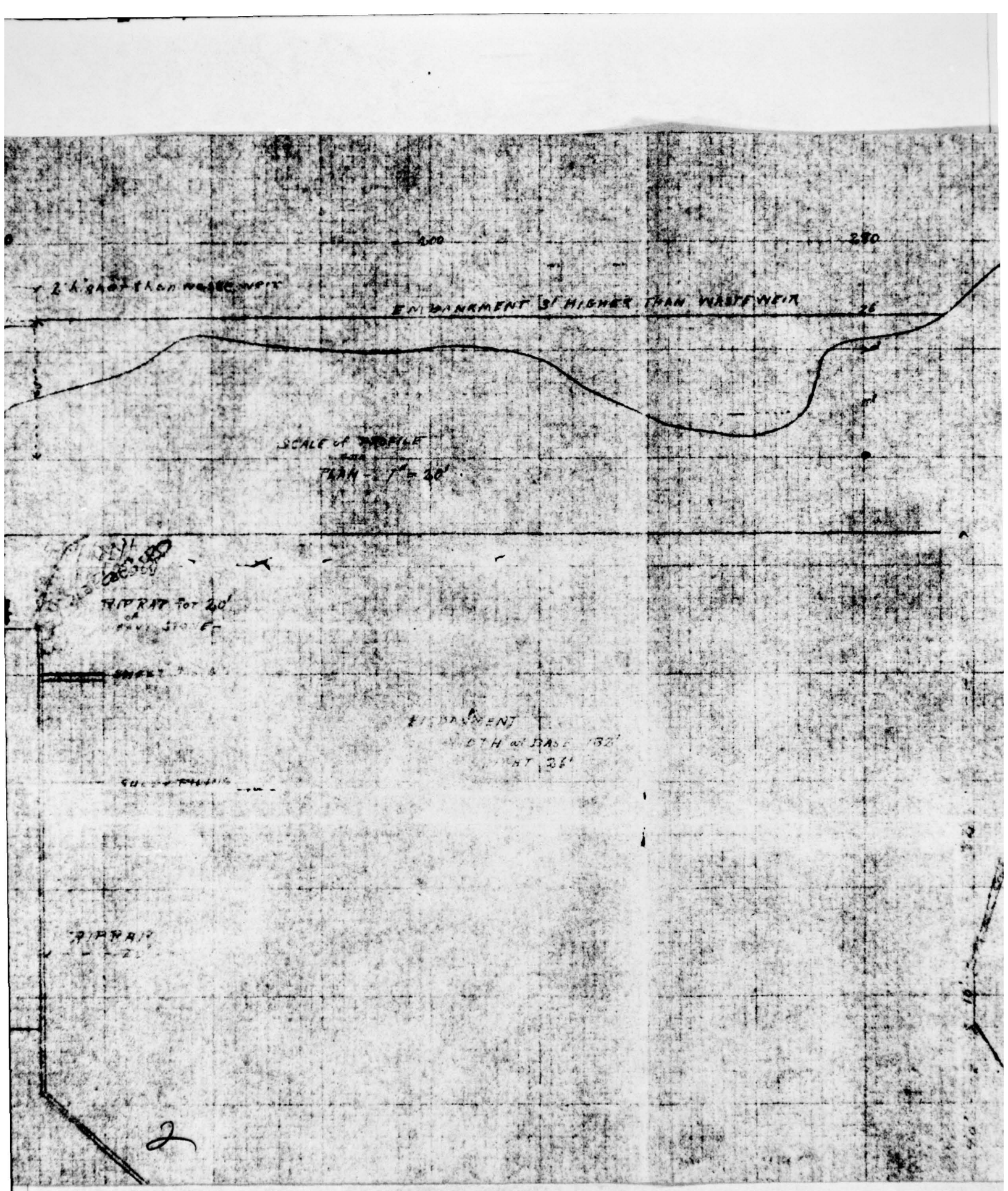
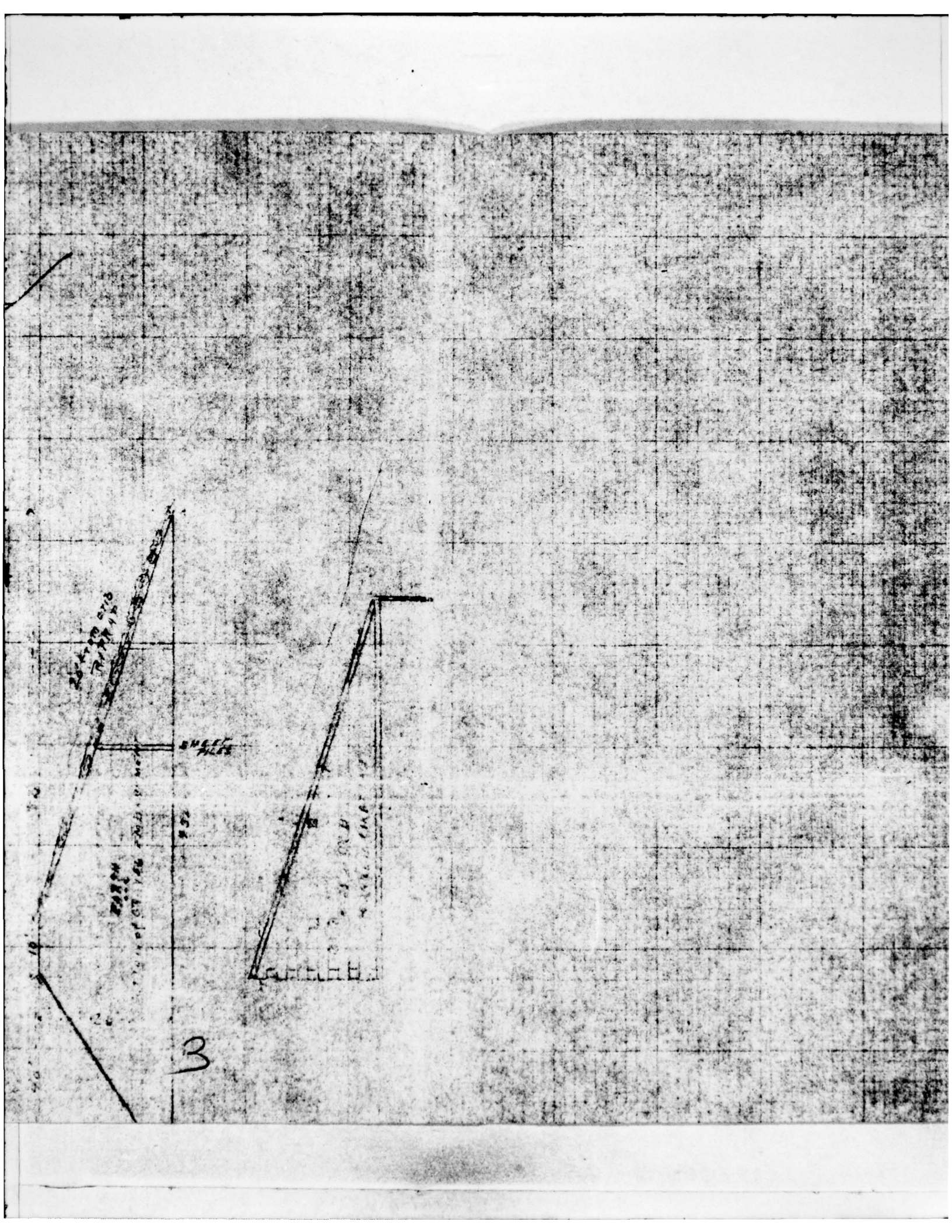
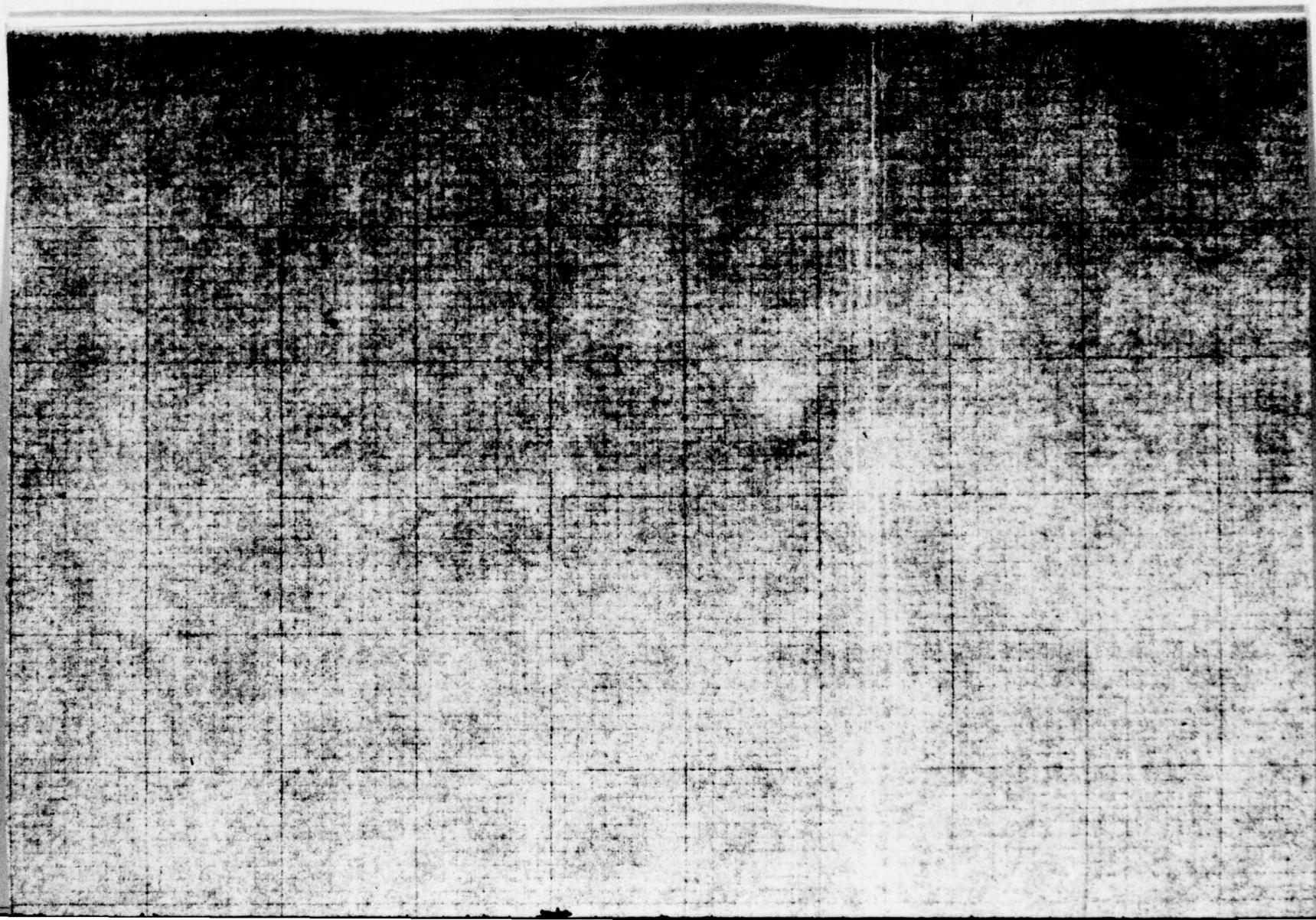
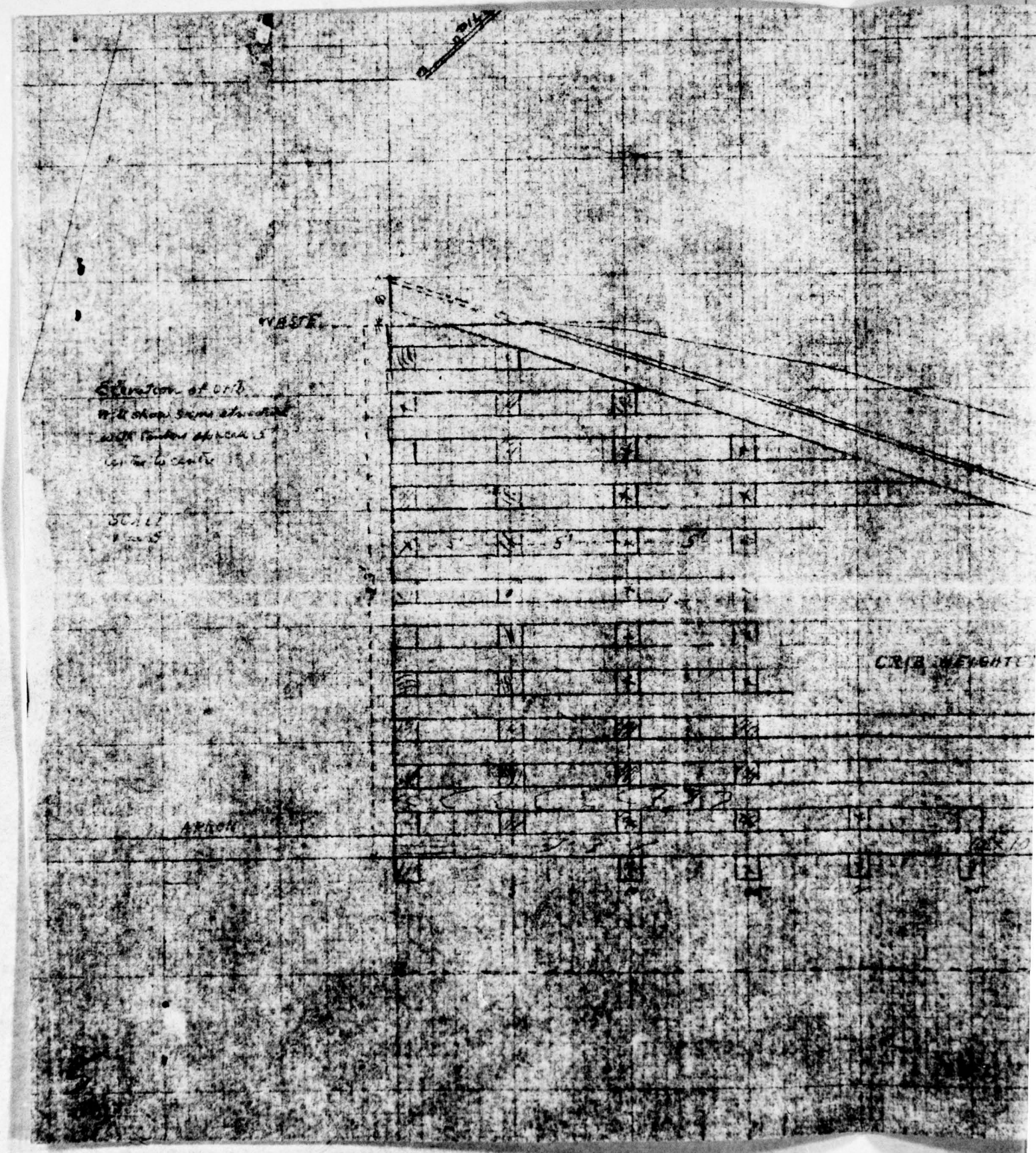
5.6
6.3
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

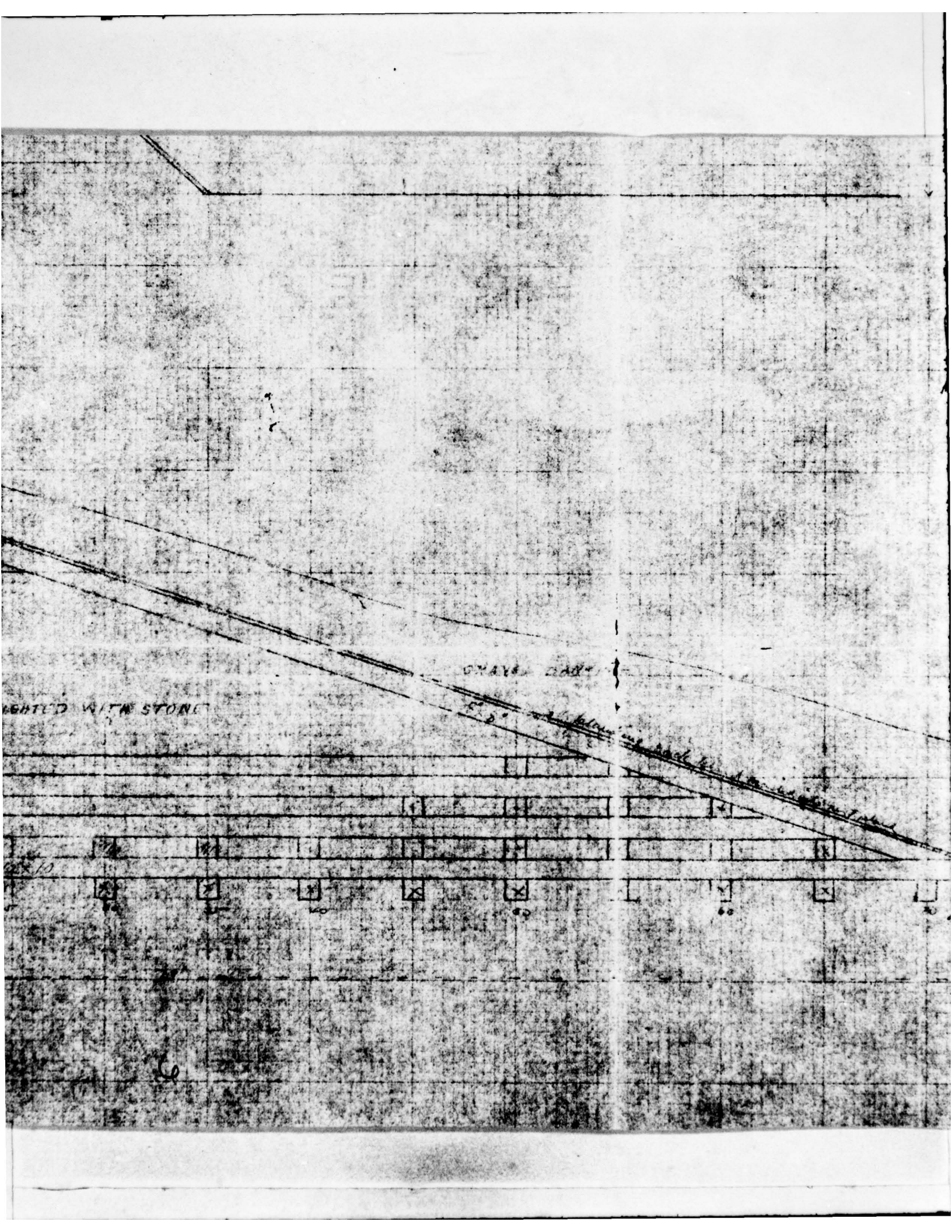

CRIB 20'
WASTE 30'
RIP RAP
RIPRAP
CRIB
RIPRAP

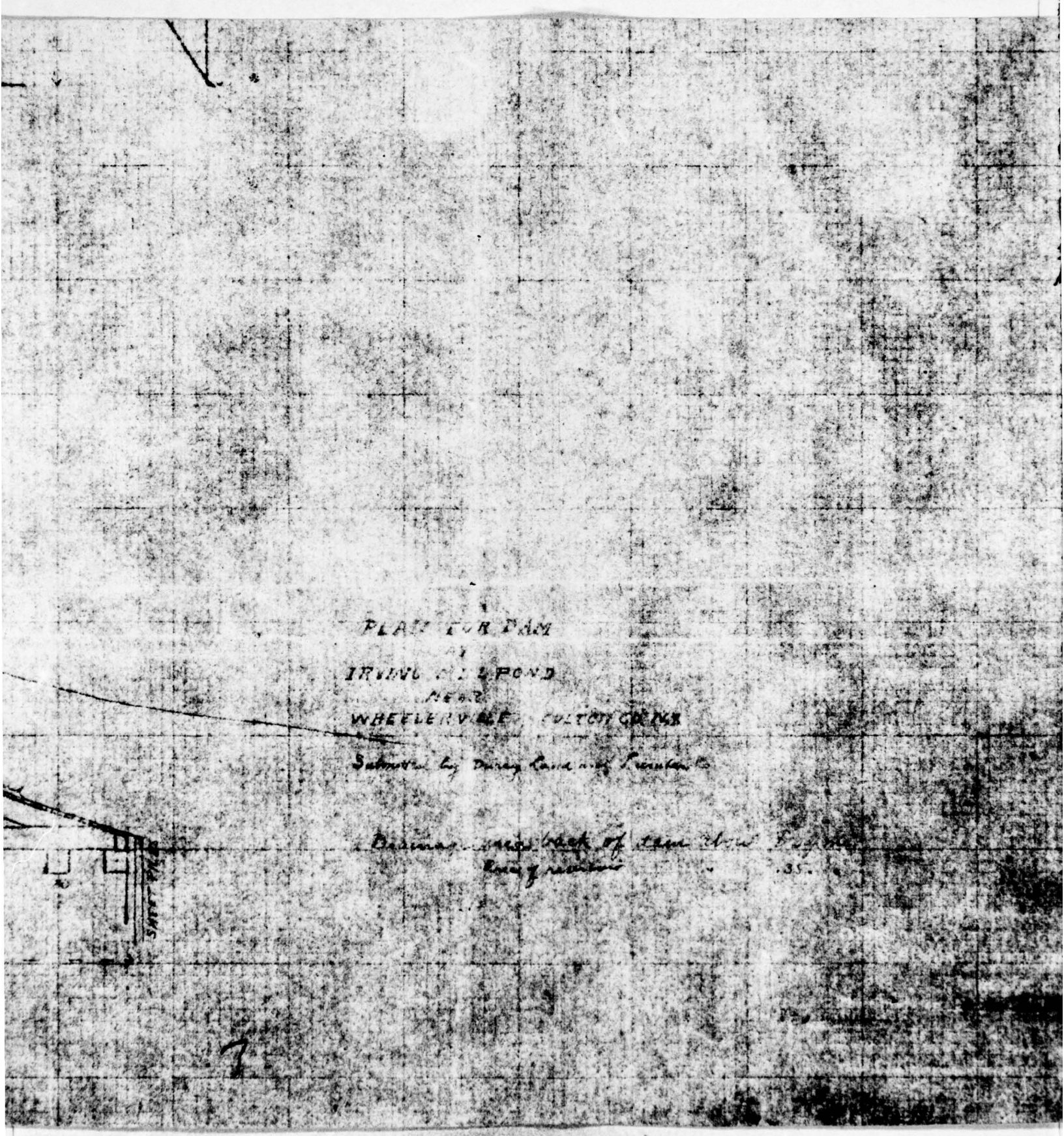

200
250
2' higher than waste weir
EMBANKMENT 3' HIGHER THAN WASTE WEIR
26
SCALE of PROFILE
HORIZ. 1" = 20'
VERT. 1" = 20'
RIPRAP for 20'
EMBANKMENT
DEPTH at BASE 32'
AT 26'
RIPRAP
2

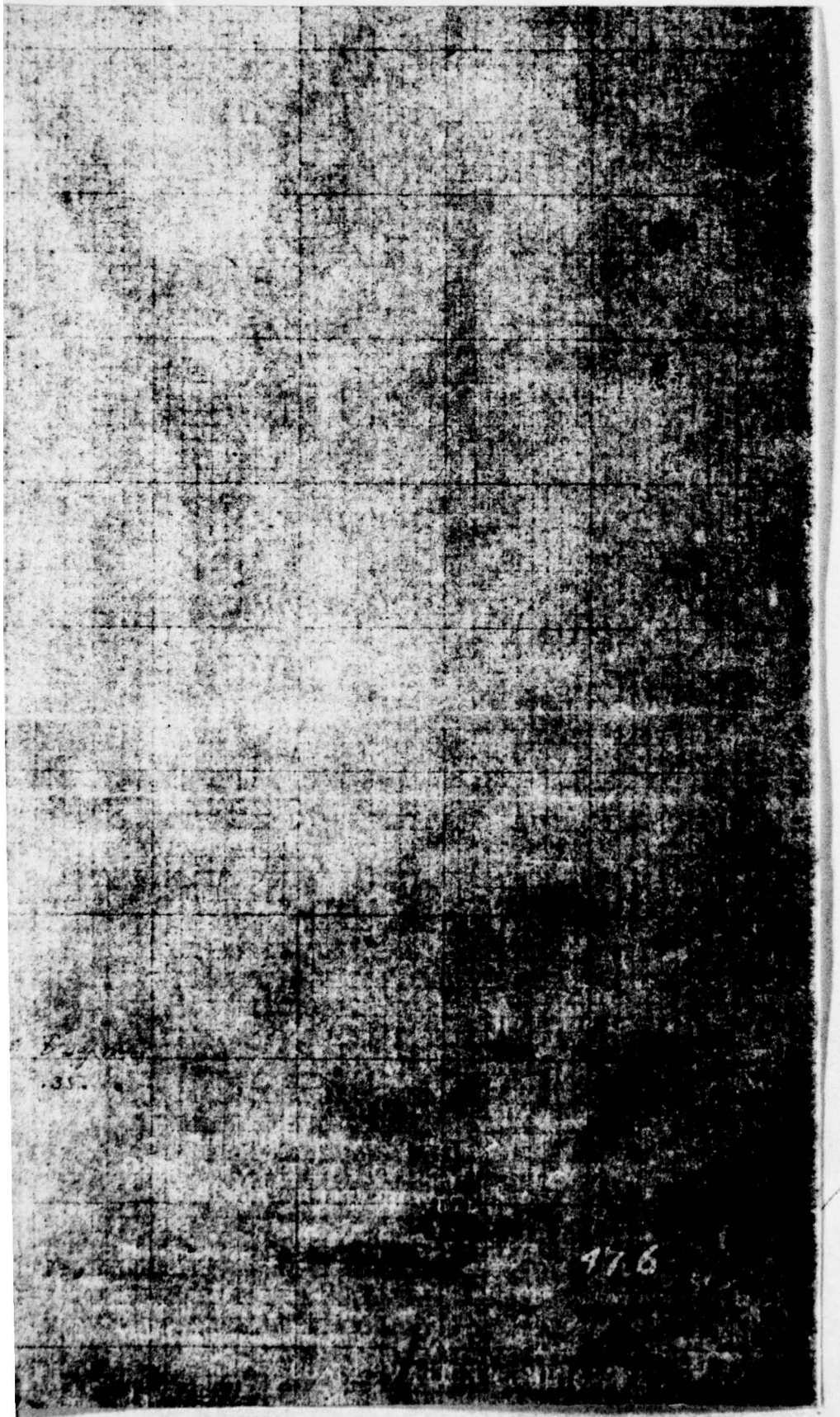

3

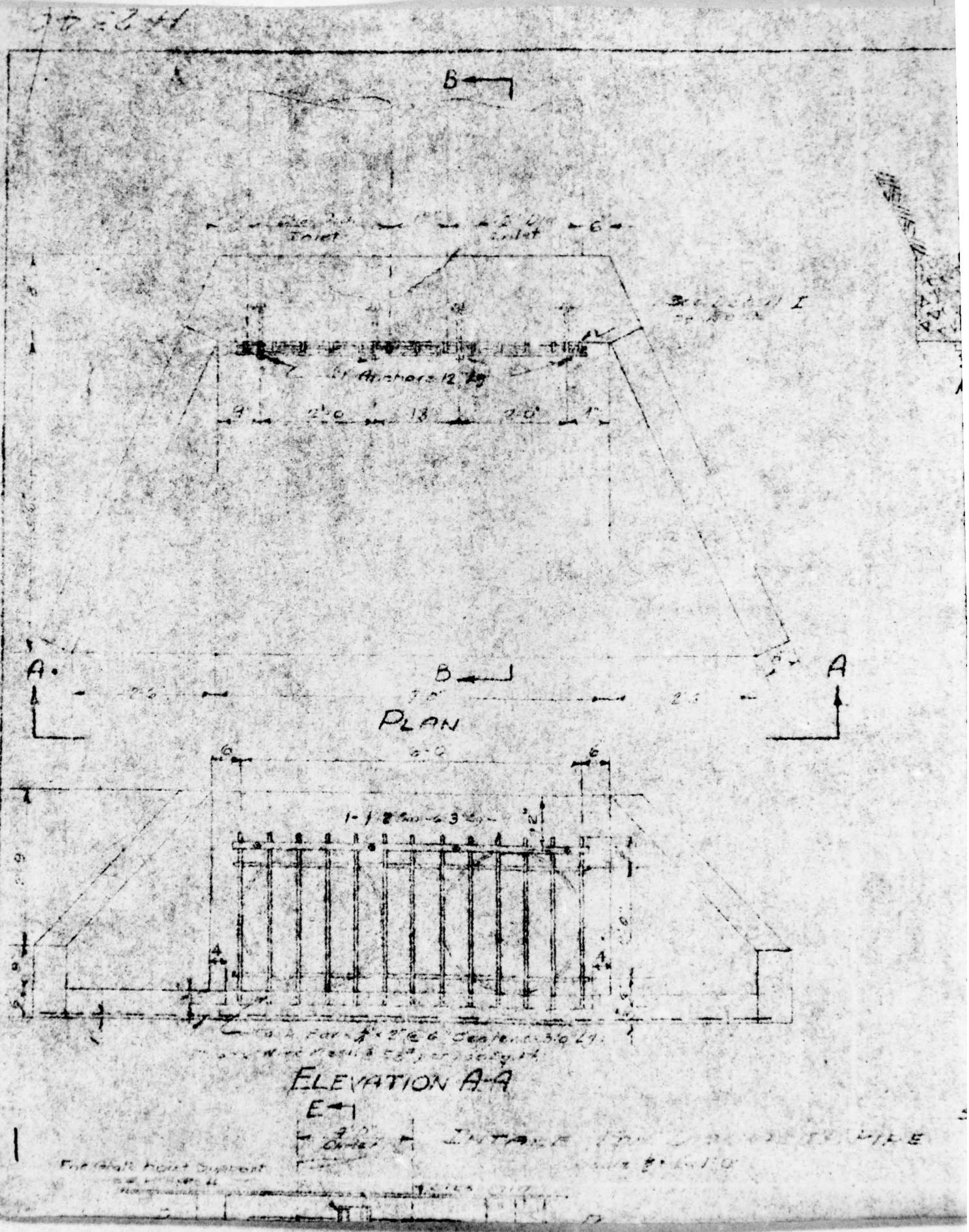


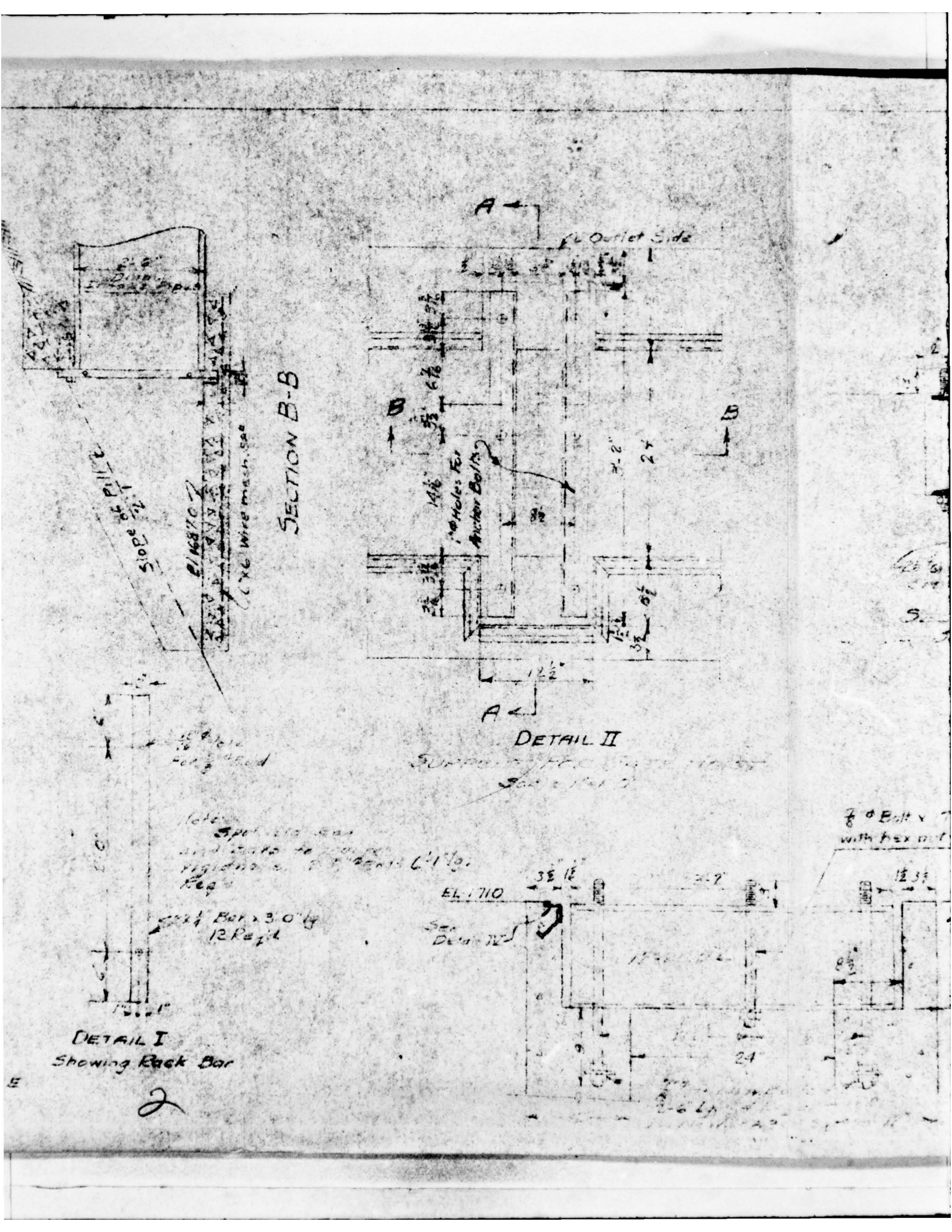

WASTE
5'
5'
CRIB WEIGHT
APRON

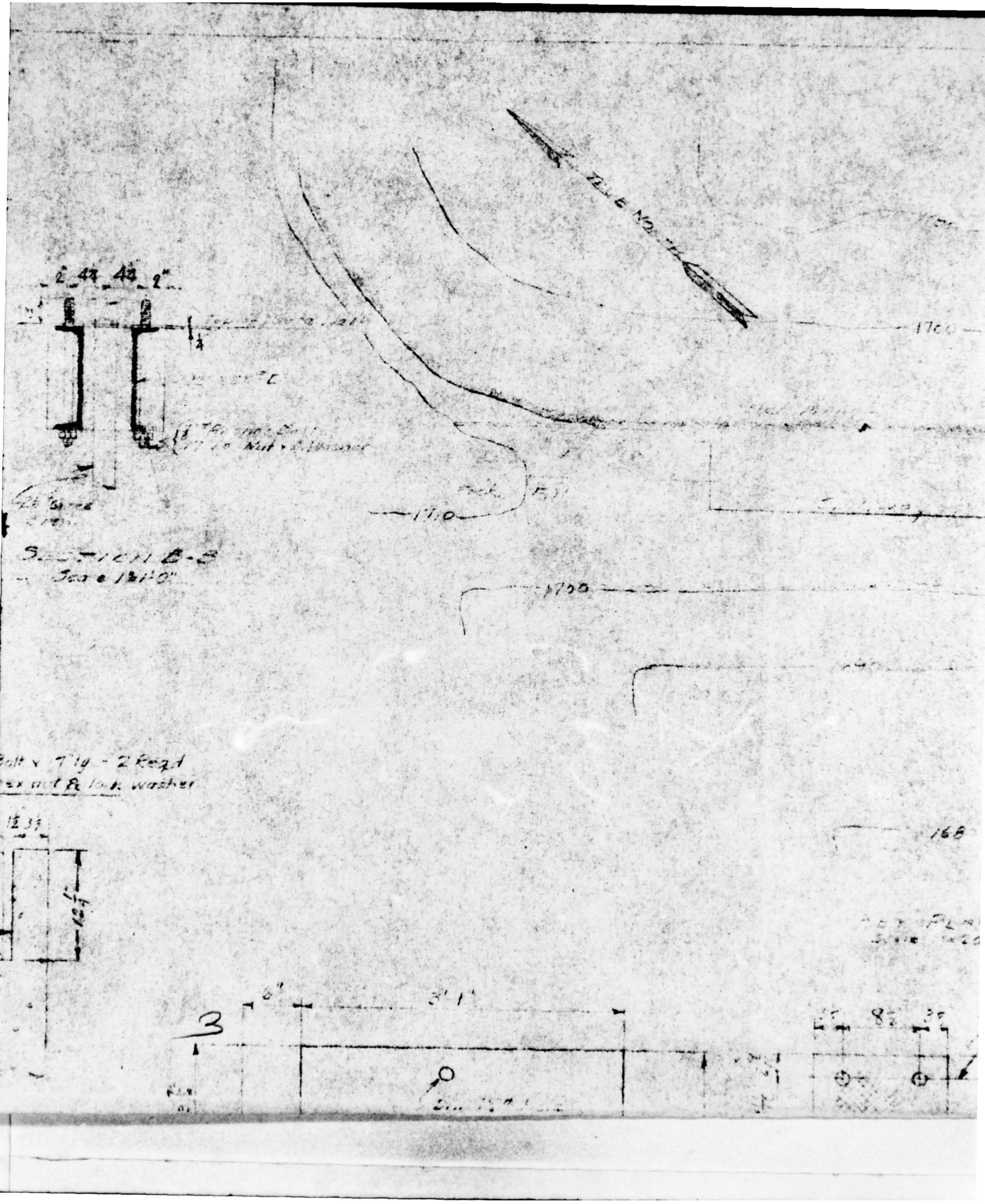


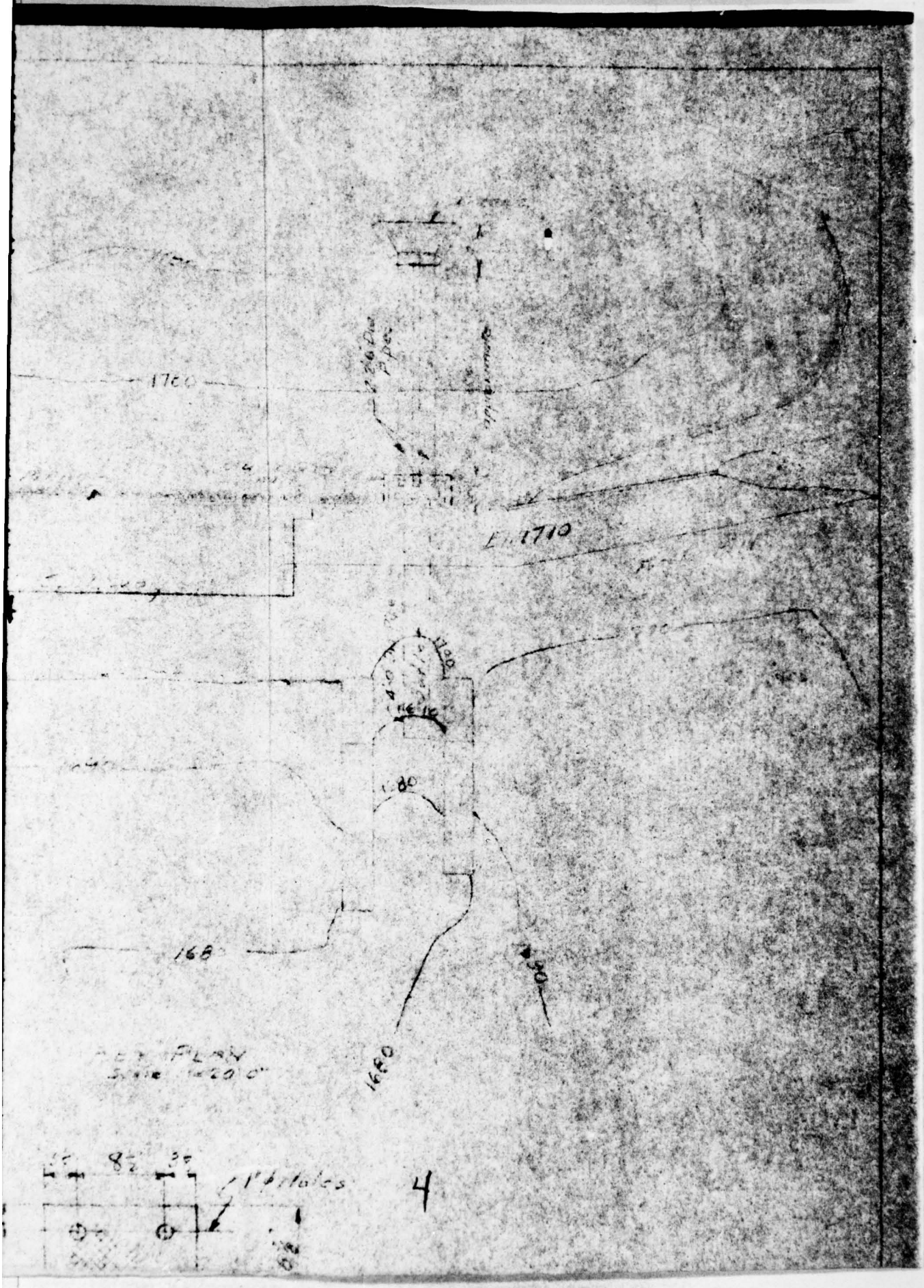

PLAN FOR DAM
IRVING POND
NEAR
WHEELERVILLE, FULTON CO. N.Y.
Submitted by Dewey Engineering Associates
SHEET PILE

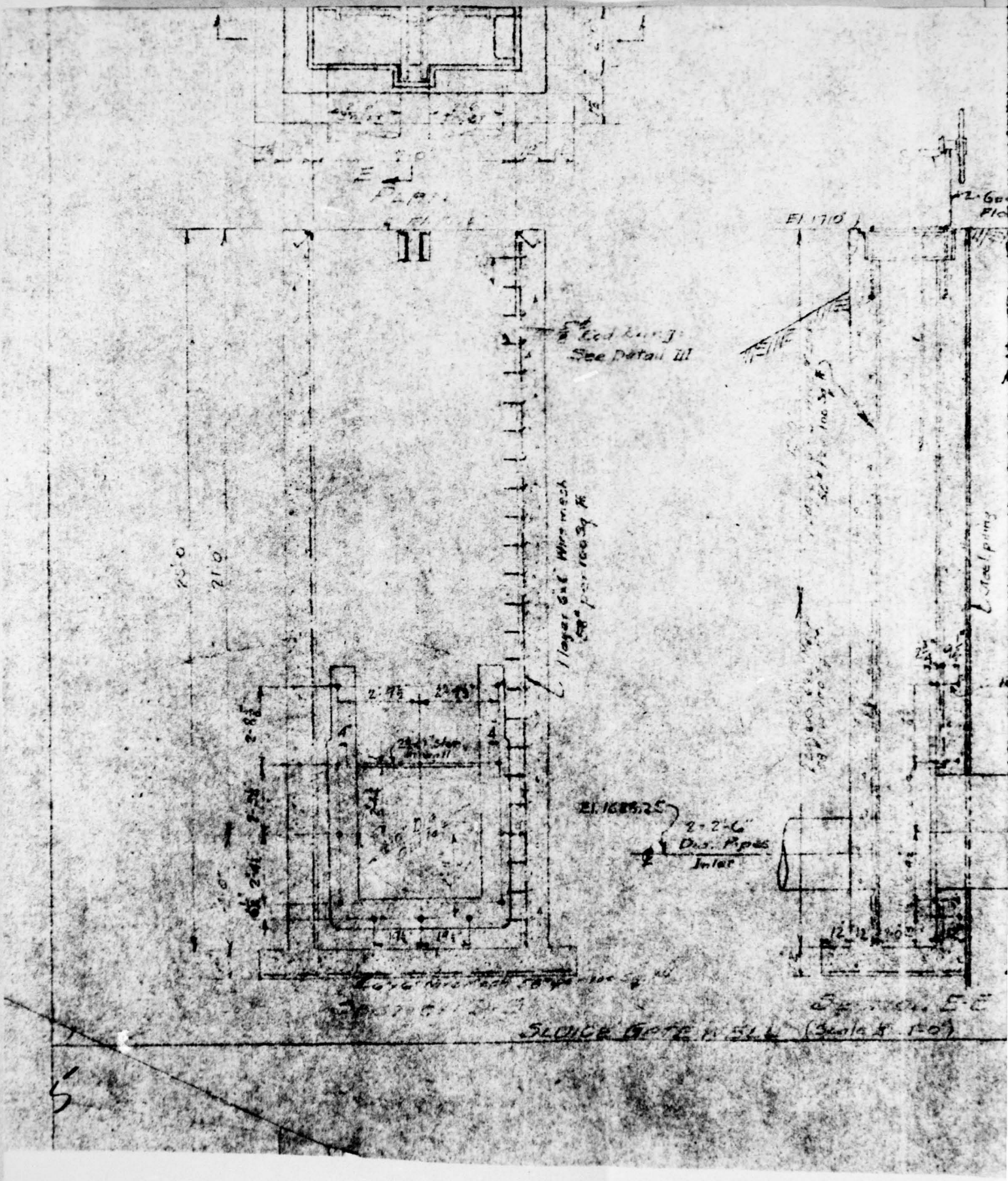

35.
47.6

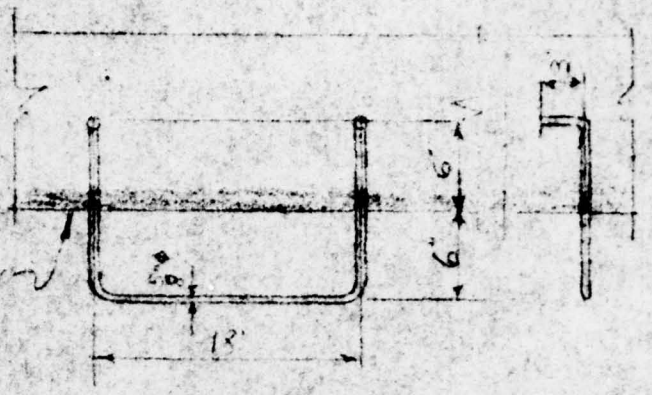

B
Inlet
Outlet
6
Anchors 12 kg
9
12'-0
18
1'-0
1'
A
B
A
PLAN
6
6
ELEVATION A-A
E
E


A
Ft Outlet Side
B
B
A
SECTION B-B
DETAIL II
DETAIL I
Showing Rack Bar
EL. 710
24


1700
1700
1700
1680
3' 1"
6"


1700
El. 1710
100
80
168
30
1680
PLAN
Scale 1"=20'-0"
8½
1" Holes
4

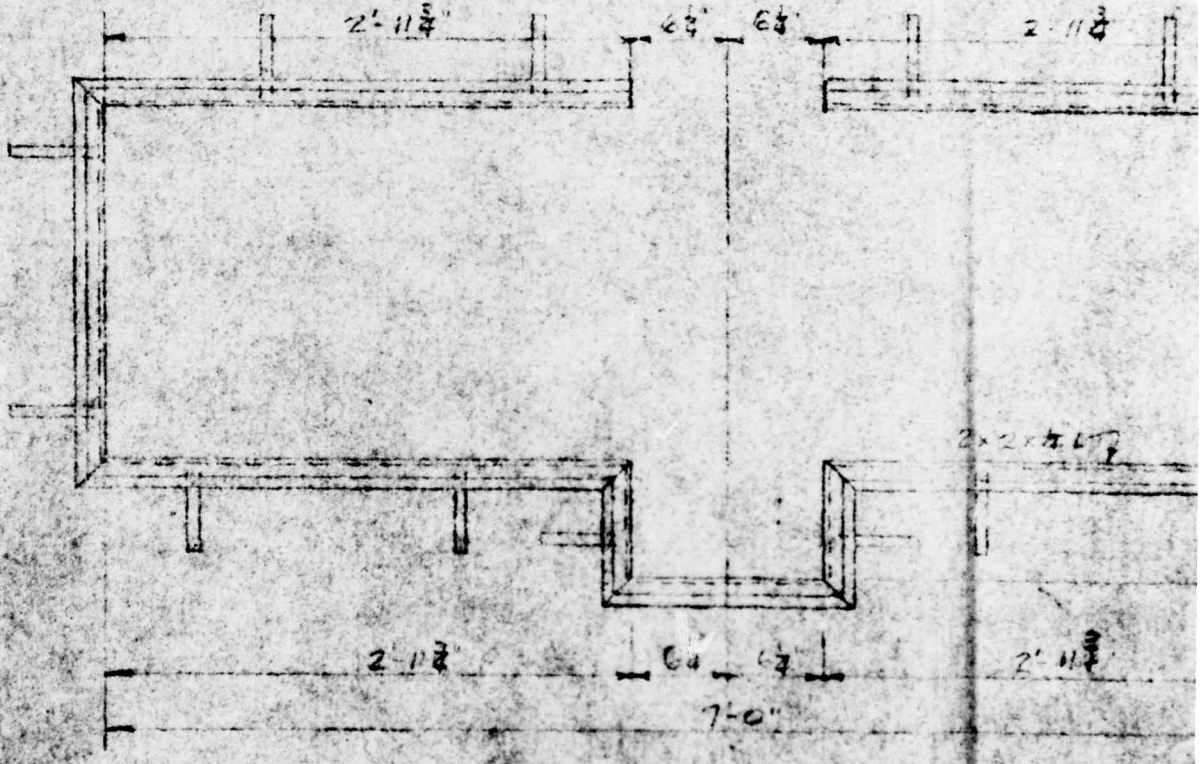

See Detail III
2-2'-6" Dia. Pipes Inlet
Steel piling
SLUICE GATE IN SLAB (Scale 1"=1'-0")



DETAIL III

$\frac{5}{8}$" Rd. Rungs - 24 Reqd

Scale 1"=1'-0"

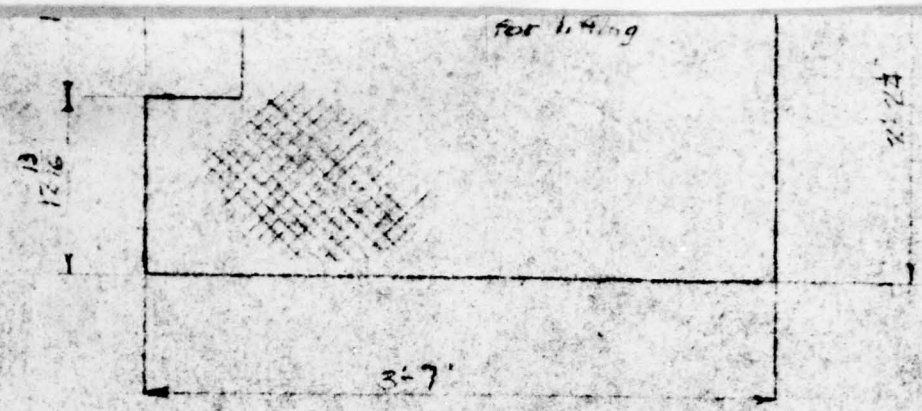


DETAIL IV

Angle Frame about top of Sluice Gate Well

Scale 1"=1'-0"

for Lifting



DETAIL V

Checkered Cover Plates - ¼" thick

1 Reqd as shown

1 Reqd opp. hand

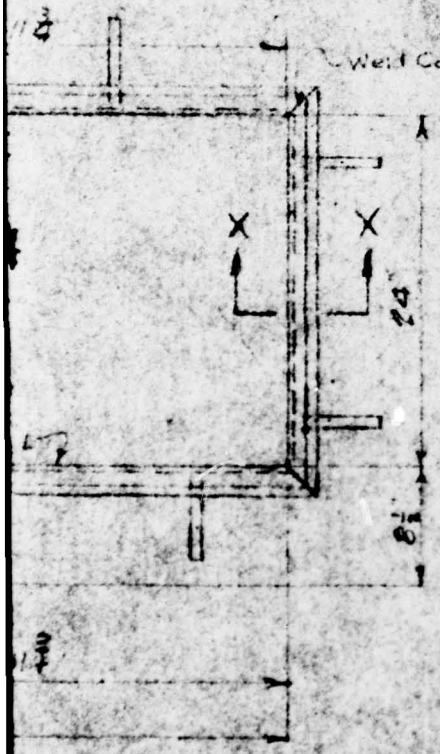
Scale 1"=1'-0"

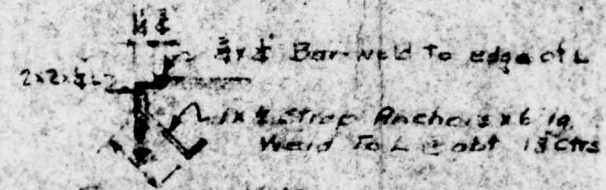
DETAIL VI

Checkered Cover

1 Reqd

Scale 1"=





Section X-X

Well

7

DETAIL VI

Checkered Cover Plate - 1/4" Thick
1 Req'd
Scale: 1"=1'-0"

Ref. Trap Rock Mfg. Co. Dwgs:
#44 - Cleared Floor Stand
#407-48 Sluice Gate

NEW YORK POWER AND LIGHT CORP.

IRVING POND

DAM

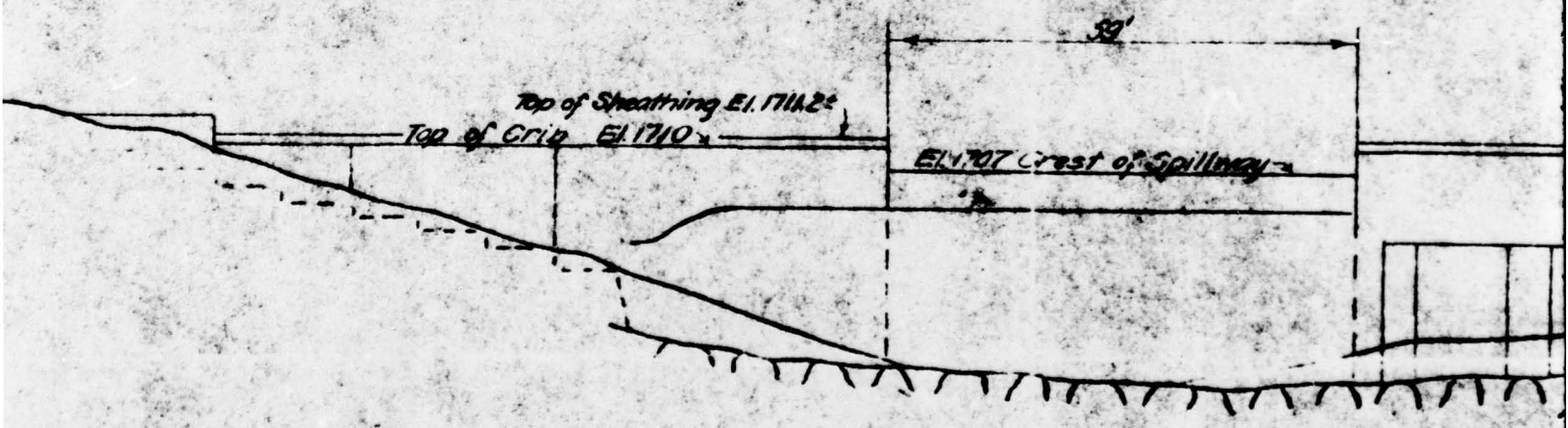
SLUICEWAY DETAILS

SCALE AS SHOWN

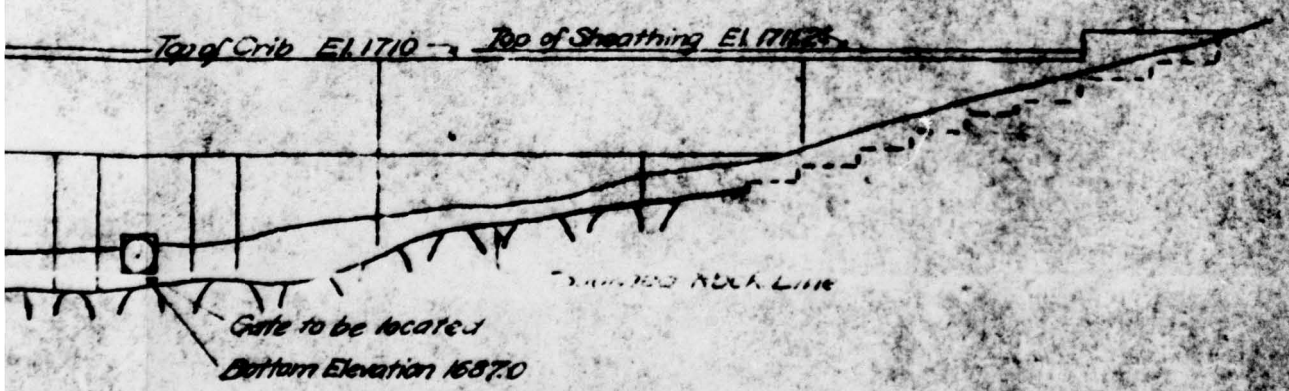
8


1720


Dam
3

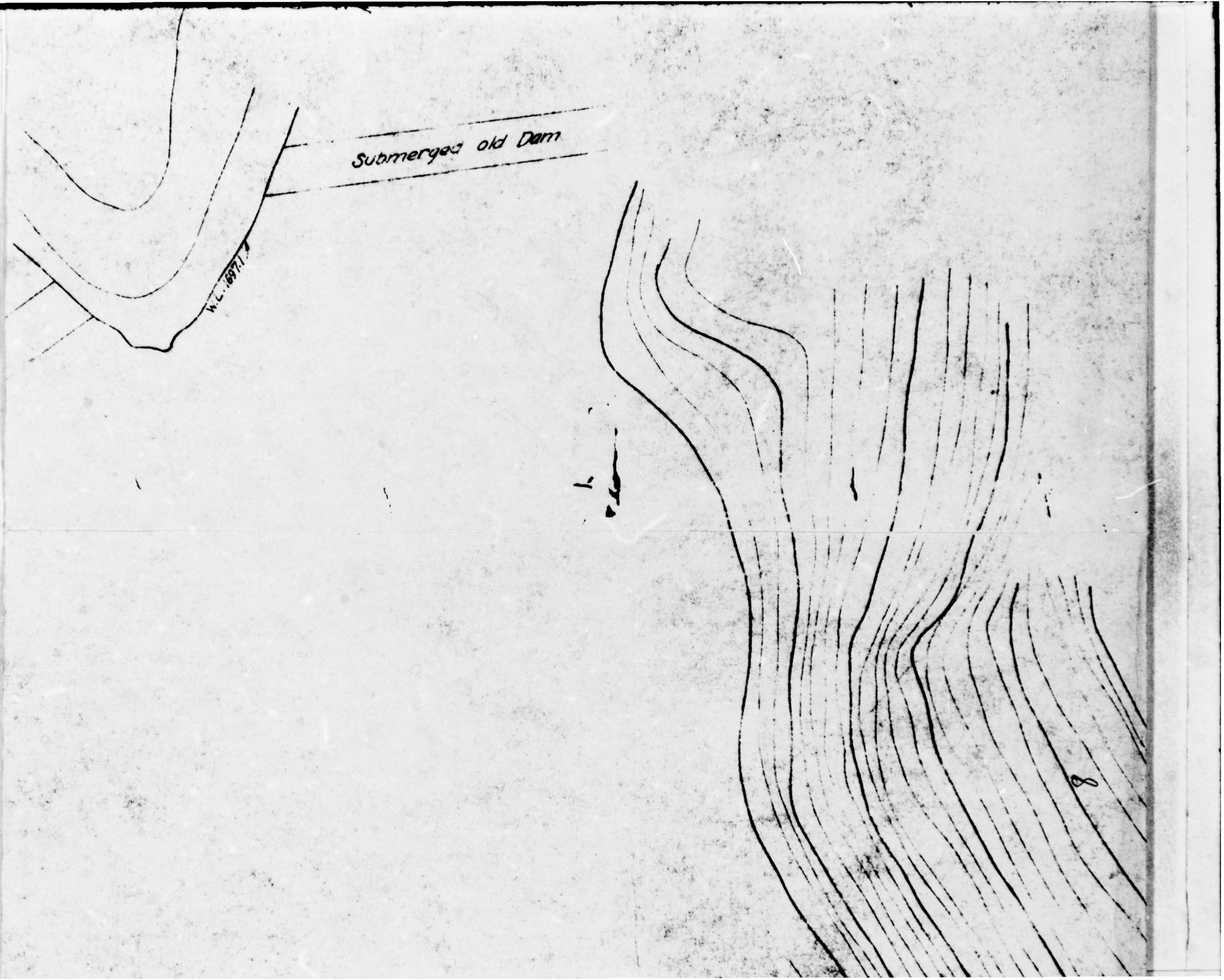


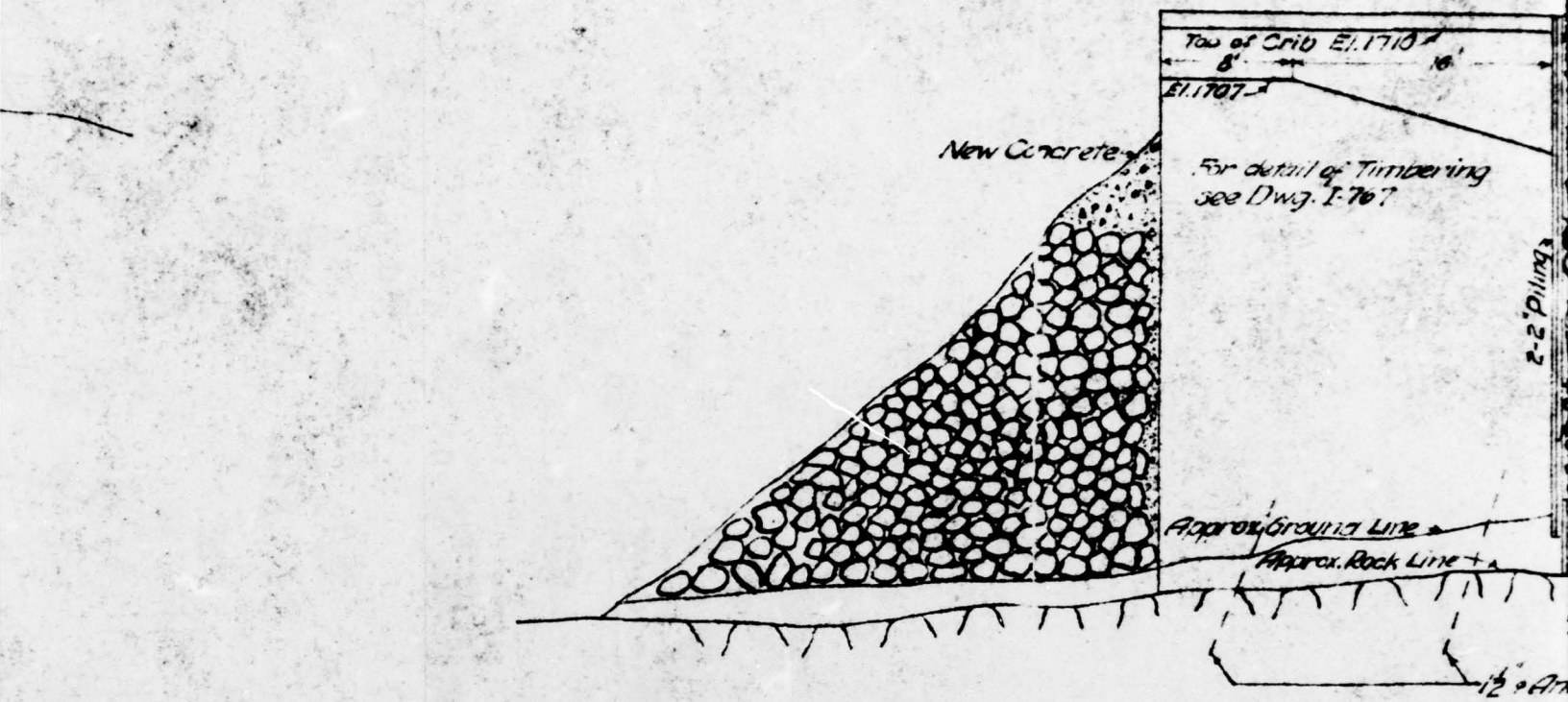
DOWNSTREAM ELEVATION.
Scale 1:20'


Top of Crib El. 1710
Top of Sheathing El. 1712
Gate to be located
Bottom Elevation 1687.0

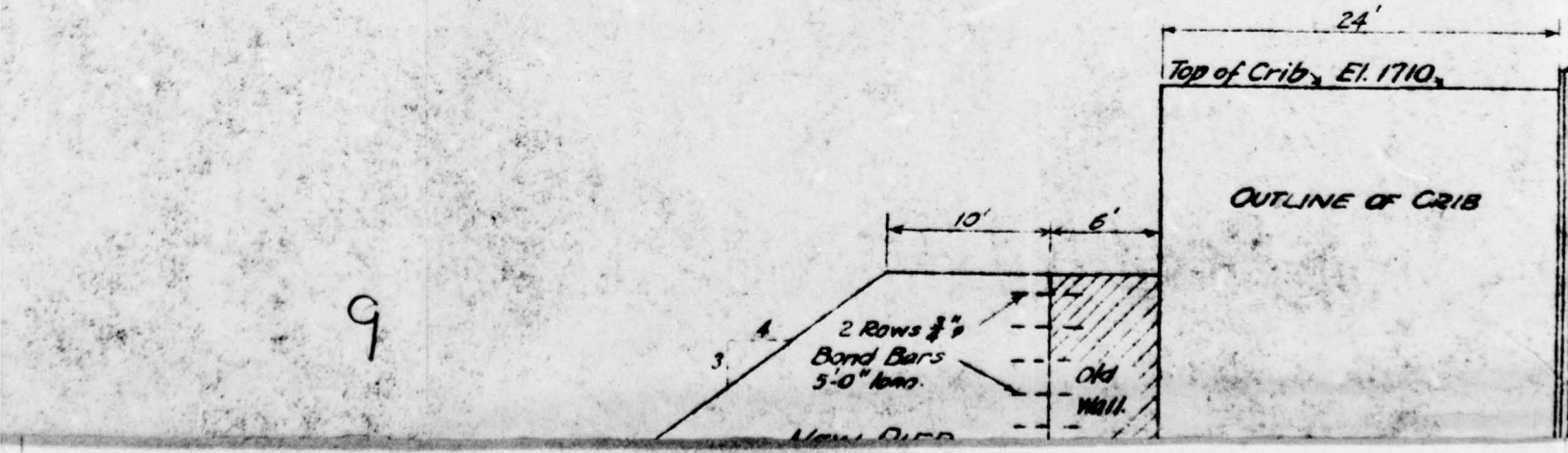
1710
1705
1695
1690
Old Bridge Pier
W.L
A
Old Dock W

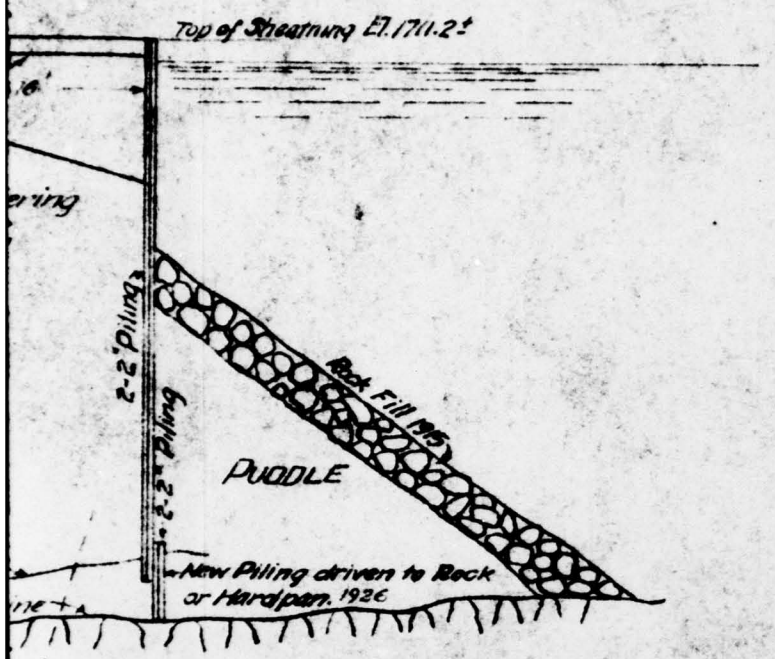
1705
1700
1695
1690
1685
1680
1675
1670
1665
NORTH
Approx. Edge of Fill
New Jersey
Rock Wall
B
B
7


Submerged old Dam
W.L. 1697.1

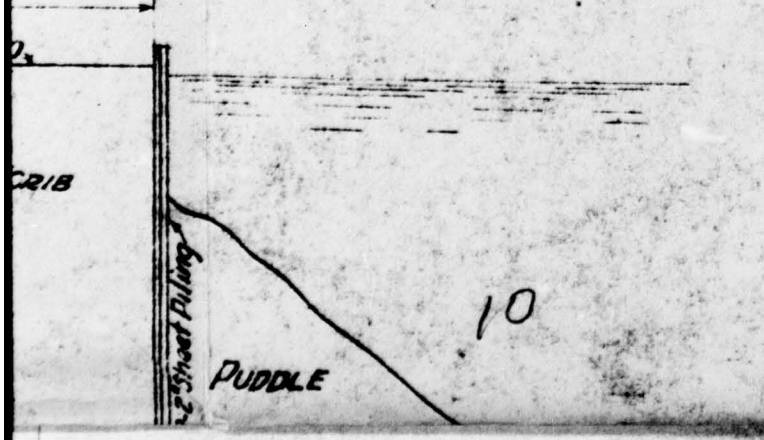


SECTION A-A.
Thru Spillway
SCALE 1/4"=1'-0"





1½" Anchor bolts 5'-0" long at cross tays.



This Drawing traced from V.B.x.B Print "A" 4734
Additional Data from L-767 and Cheney's Inventory.

PLAN
Scale 1" = 20'-0"

SECTION B-B.

Retaining Crib & New Pier.

Scale 1"=10'-0"

NOTE: This section changed 9-28-26. See for detail of Timbering, Pipe etc

All cribs to be built of timbers of length multiples
Average diameter of log 13".
Sheathing to extend one foot above top of crib.
Bottom elevation of sheet piling to be determined
Puddle upstream side of all cribs.
Condition of present masonry is to be approved before new construction is started.

IRVING POND DAM

SITE: OUTLET OF IRVING POND, A TRIBUTARY
CANADA LAKE, CAROGA TOWNSHIP,
FULTON COUNTY. NEW YORK.

SUBMITTED BY THE DUREY LAND & LUMBE
GREEN LAKE, NEW YORK.

1½" Anchor bolts 3'-0" long at cross logs.

ION B-B.
Crib & New Pier.
1"=10'-0"

anged 9-28-26. see dwg. F-767
imbering, Pipe etc

of length multiples of 8'-0" out to out.

above top of crib.
ng to be determined in field.
cribs.
ry is to be approved by Power Cos. engineer
started.

A TRIBUTARY OF
A TOWNSHIP,
ORK.
LAND & LUMBER CO.
ORK.

A. R. & L. Corp.

IRVING POND DAM

Plan and Sections

Scales: as shown.

DRAWN	TRACED	CHECKED
1-5-28	W.S.	W.C.T.
2-11-28	[illegible]	[illegible]

15

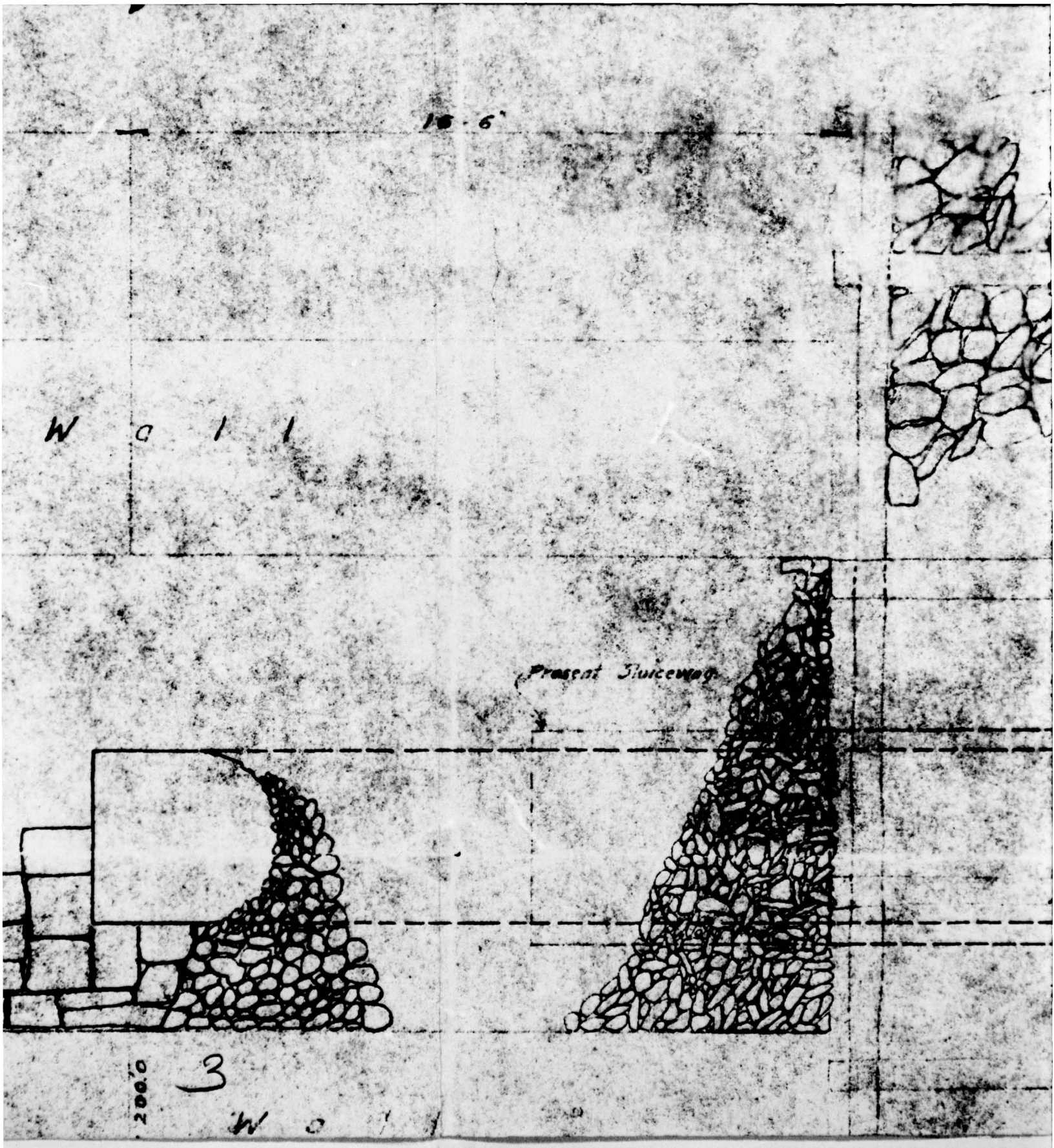
1967

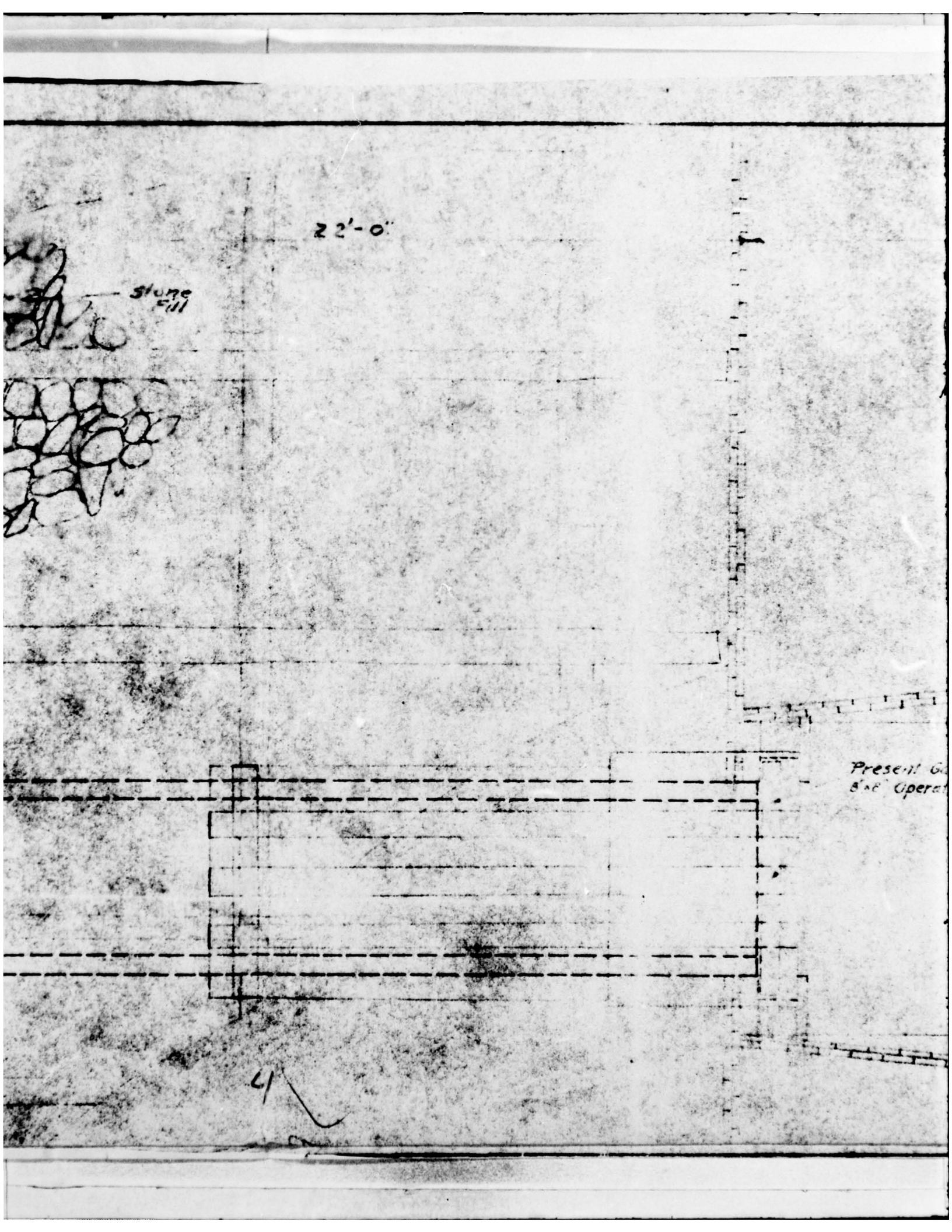
5'-0"

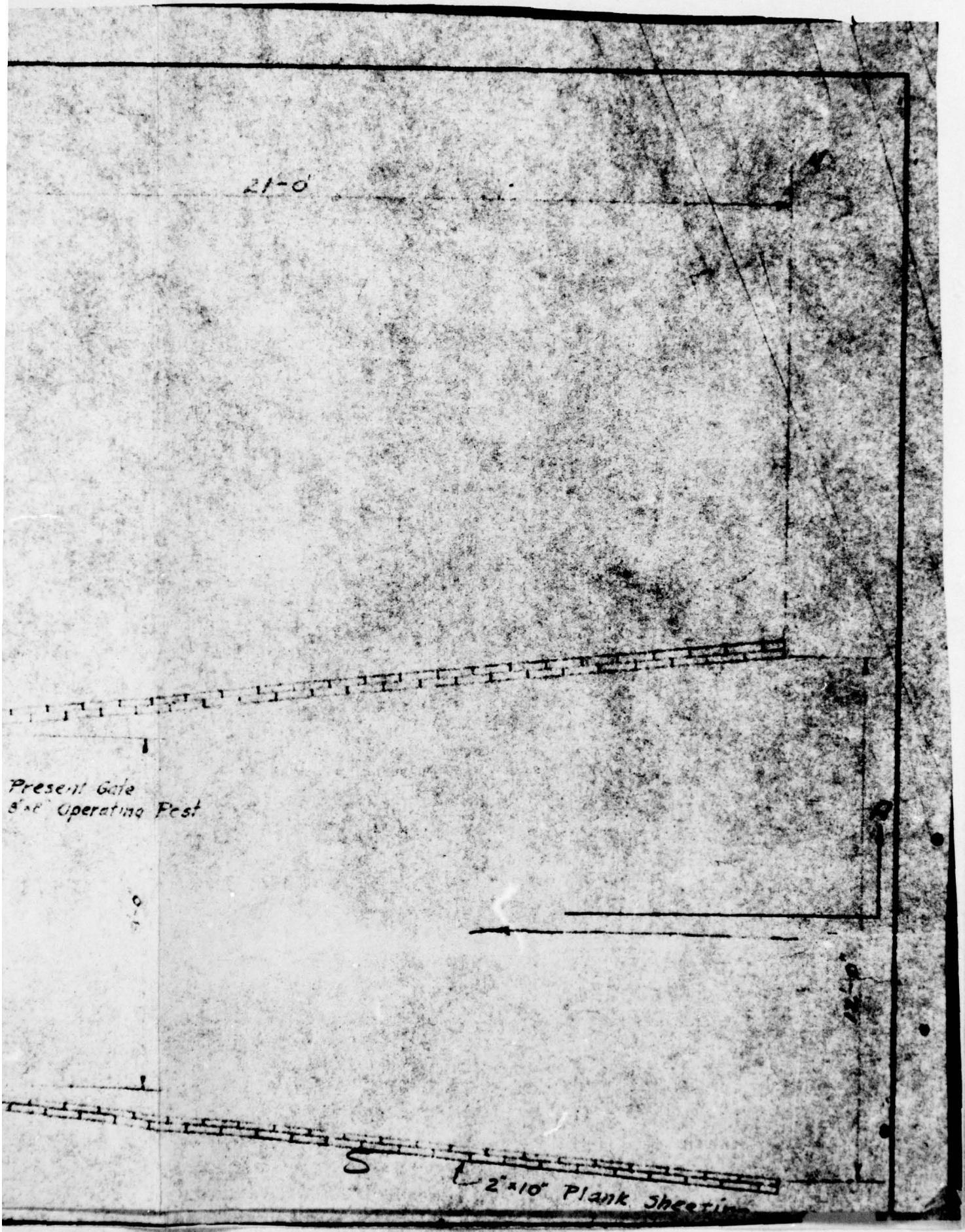
A

11'-0"

23'-0"
5'-0
Concrete
11'-0"
Toe of Rock Fill
0'
@ 105.0
Concrete


18.6'
W a l l
Present Sluiceway
20.0
3
W o r k


22'-0"
Stone Sill
Present G
Base Opera
4

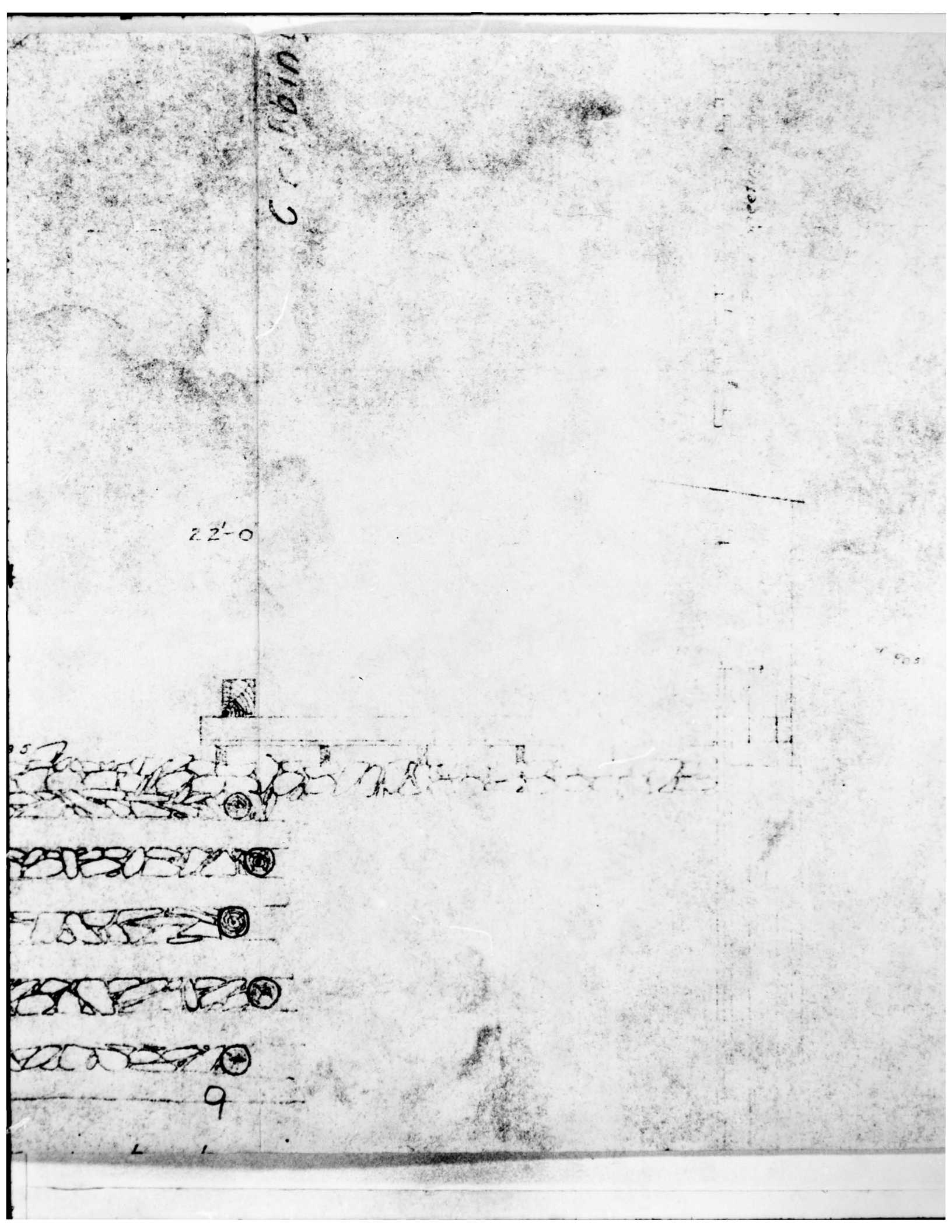

21-0'
Present Gate
8'x8' Operating Post
2"x10" Plank Sheeting

5'

1-2 1/2

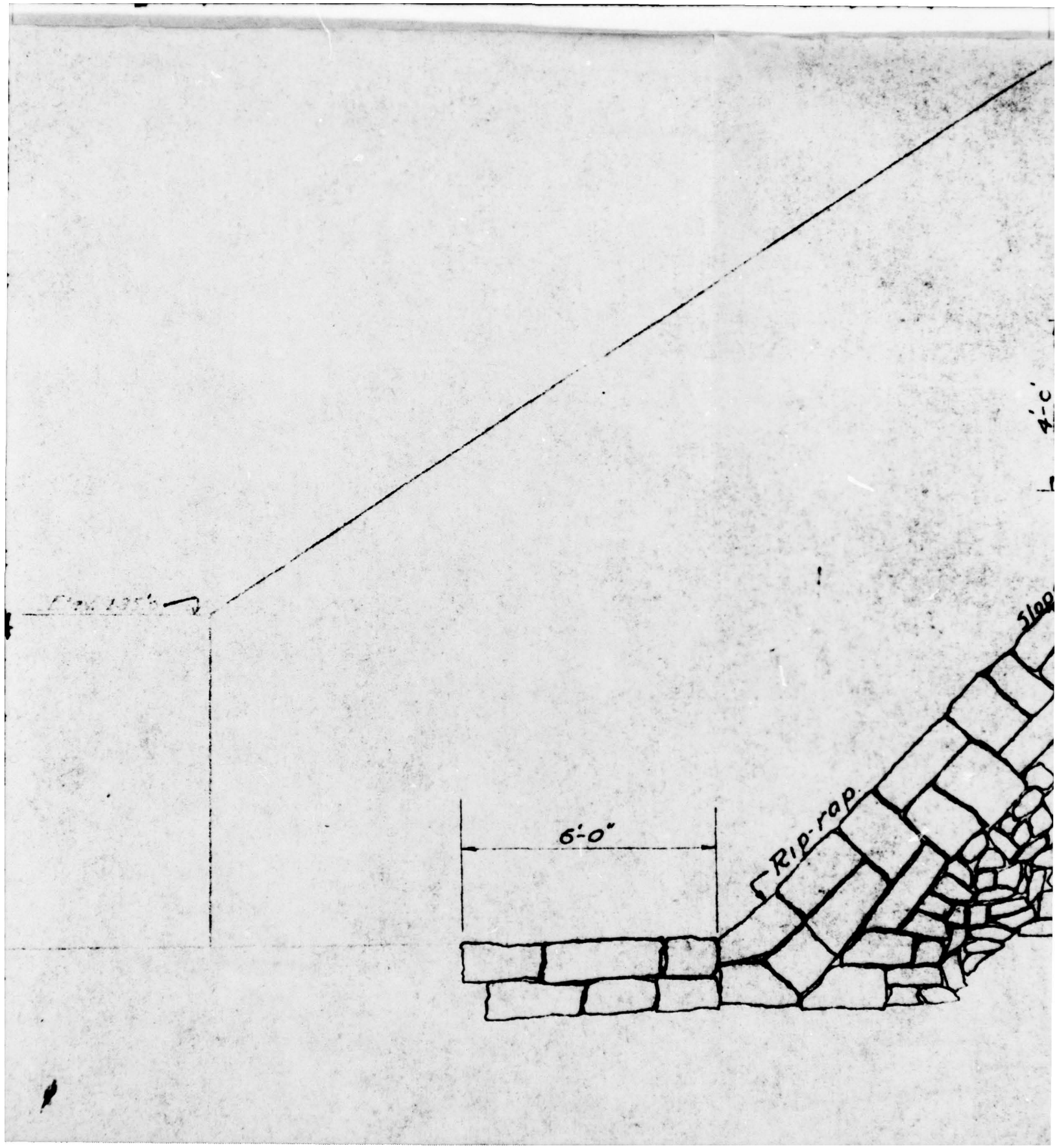
1

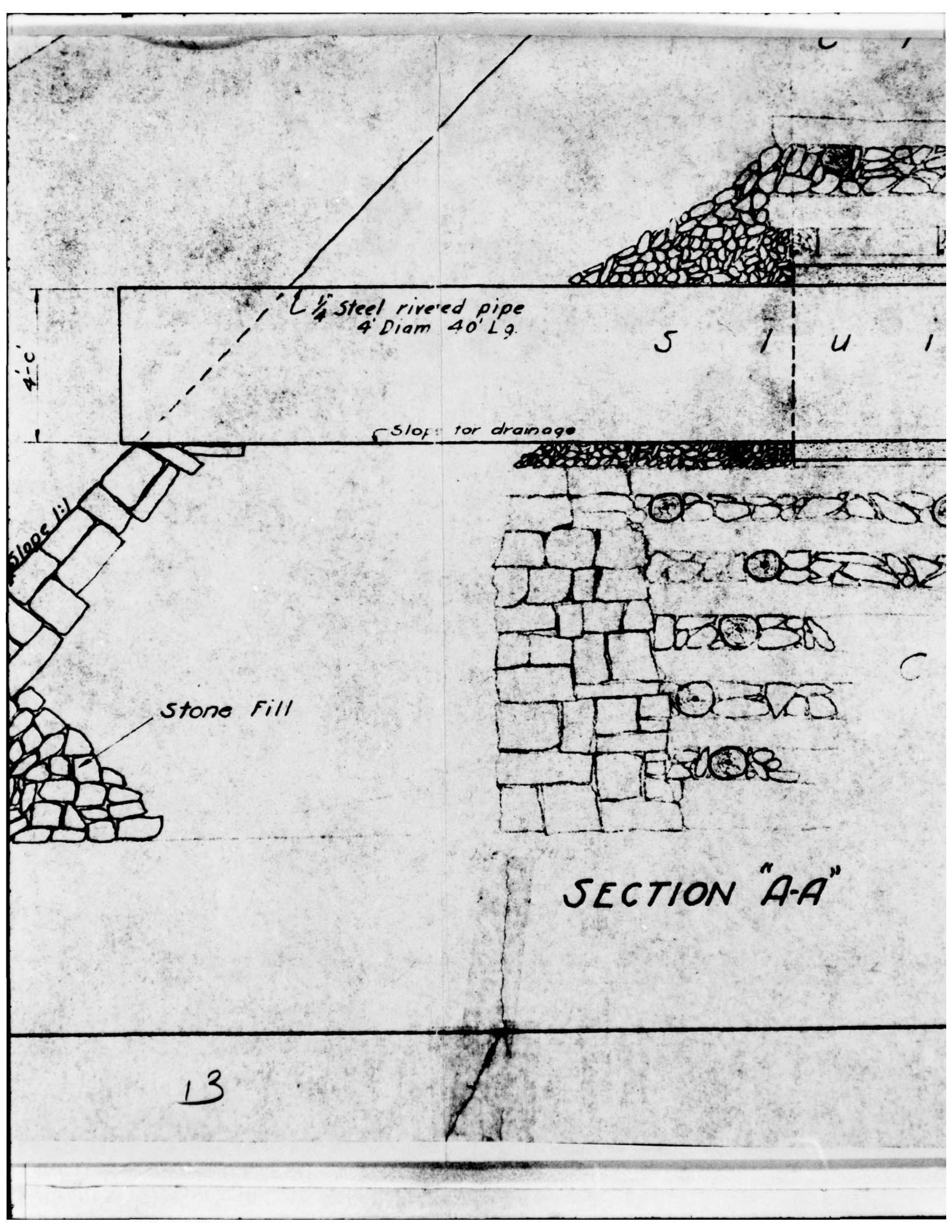
PLAN

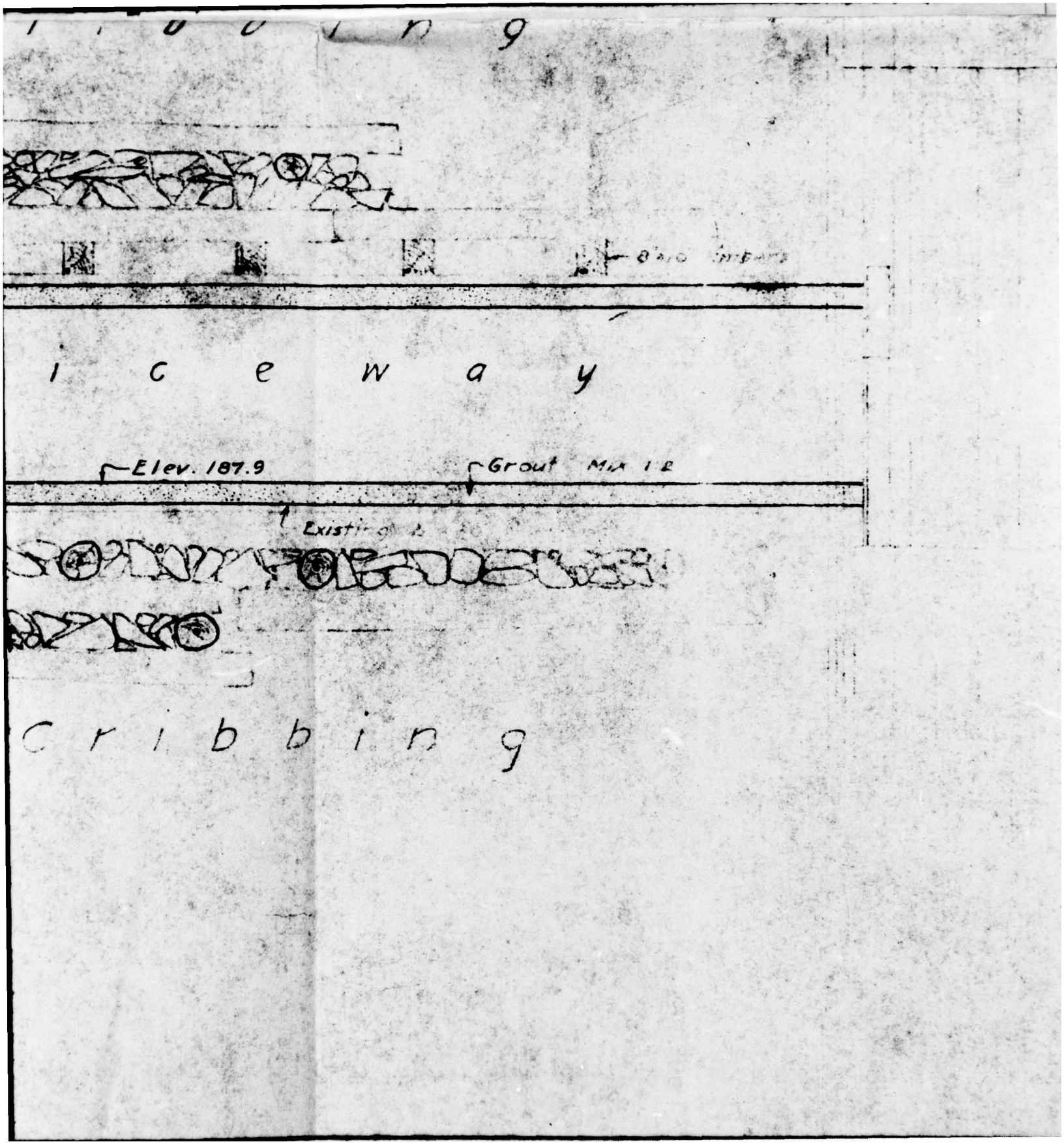

22'-0"
9

10

Town of Garoga
County of Fulton
N.B. 425 Pgs. 15-17 Inc.


6'-0"
Rip-rap


1/4 Steel rive'ed pipe
4' Diam 40' Lg.
4'-0"
Slope for drainage
Slope 1:1
Stone Fill
SECTION "A-A"
13


Elev. 187.9
Grout Mix 1:2
Existing
iceway
cribbing

A. P. & L. CORP.

IRVING POND

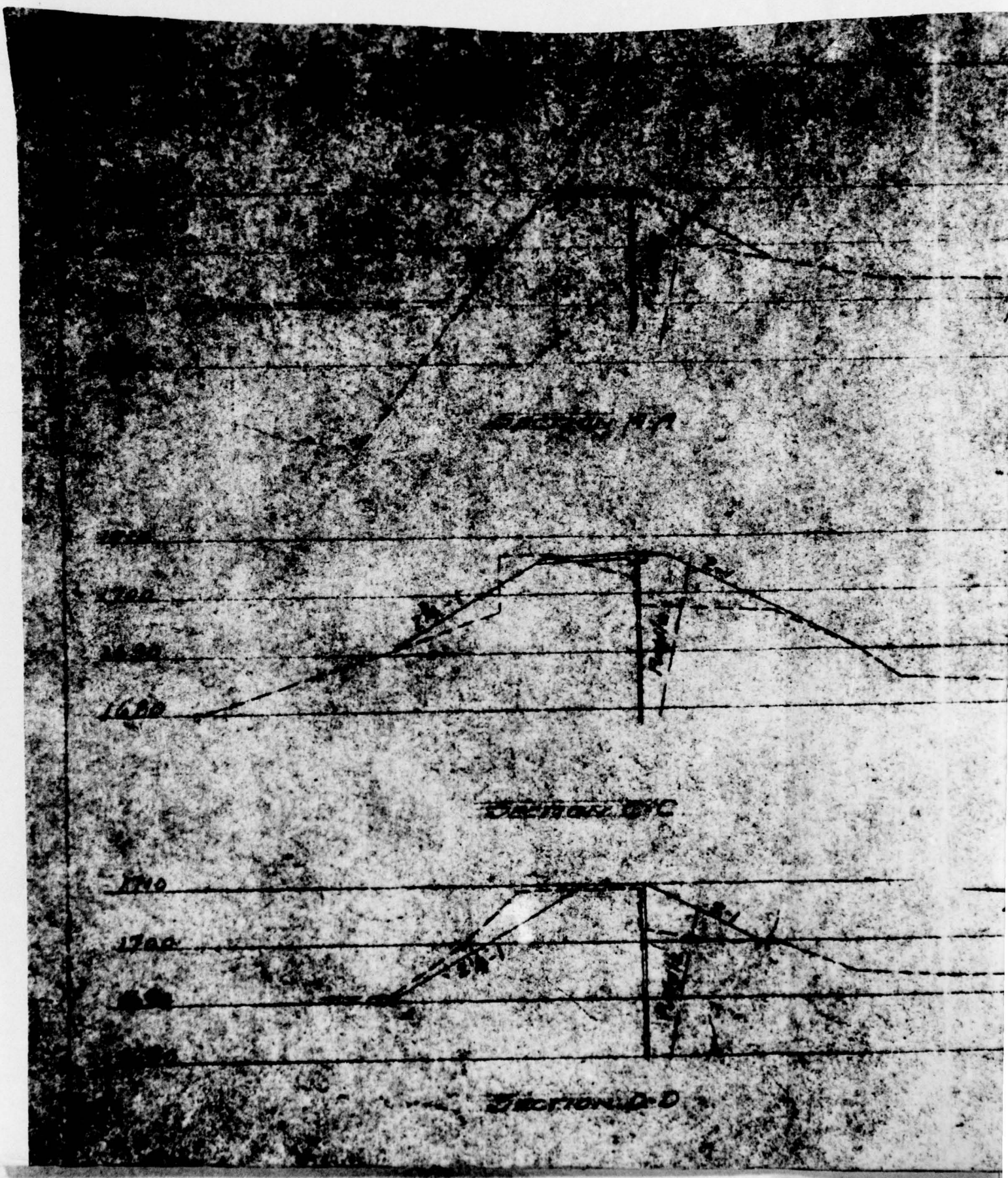
Sluiceway Reconstruction

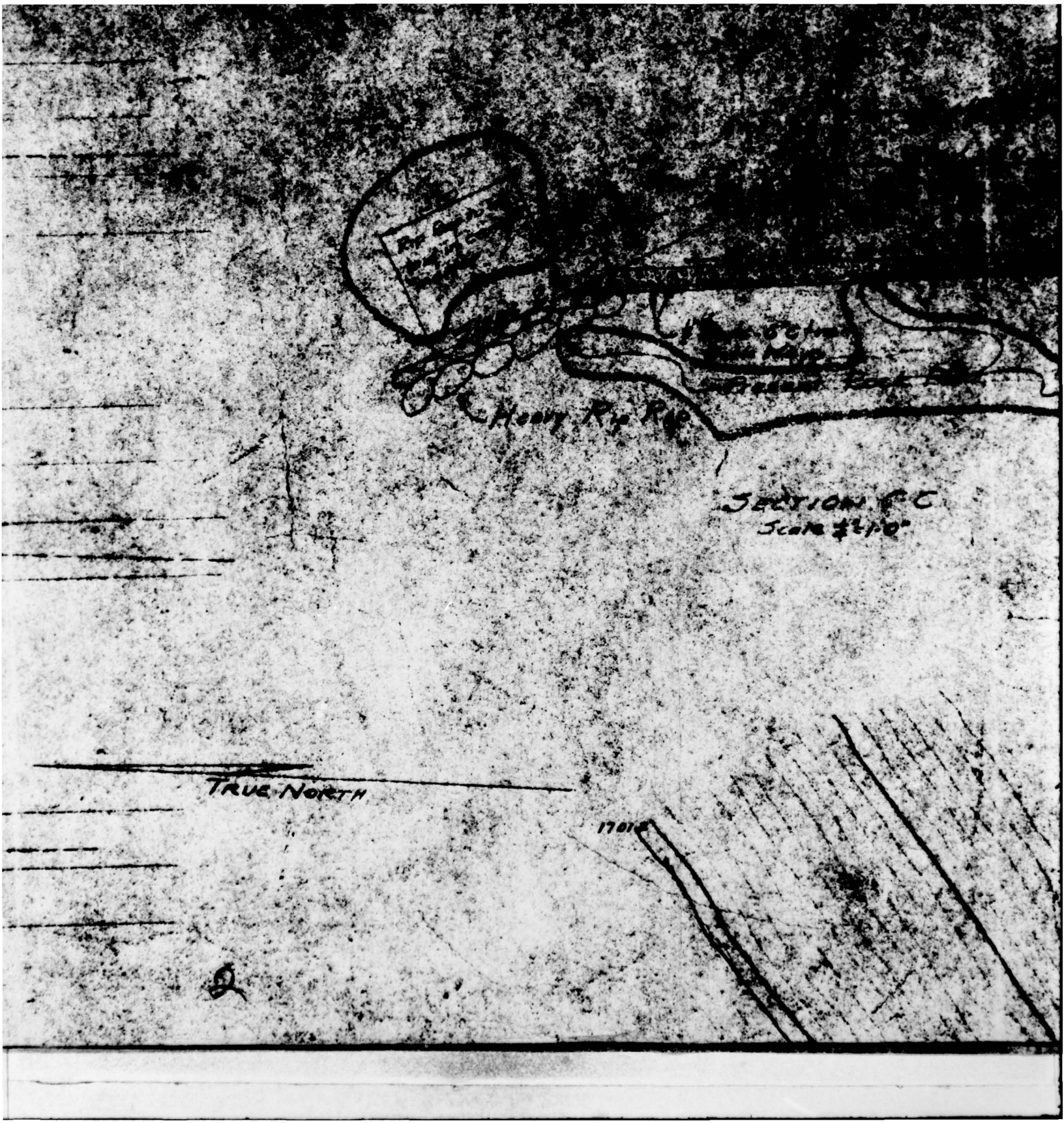
Scale $\frac{3}{8}$" - 1 Ft.

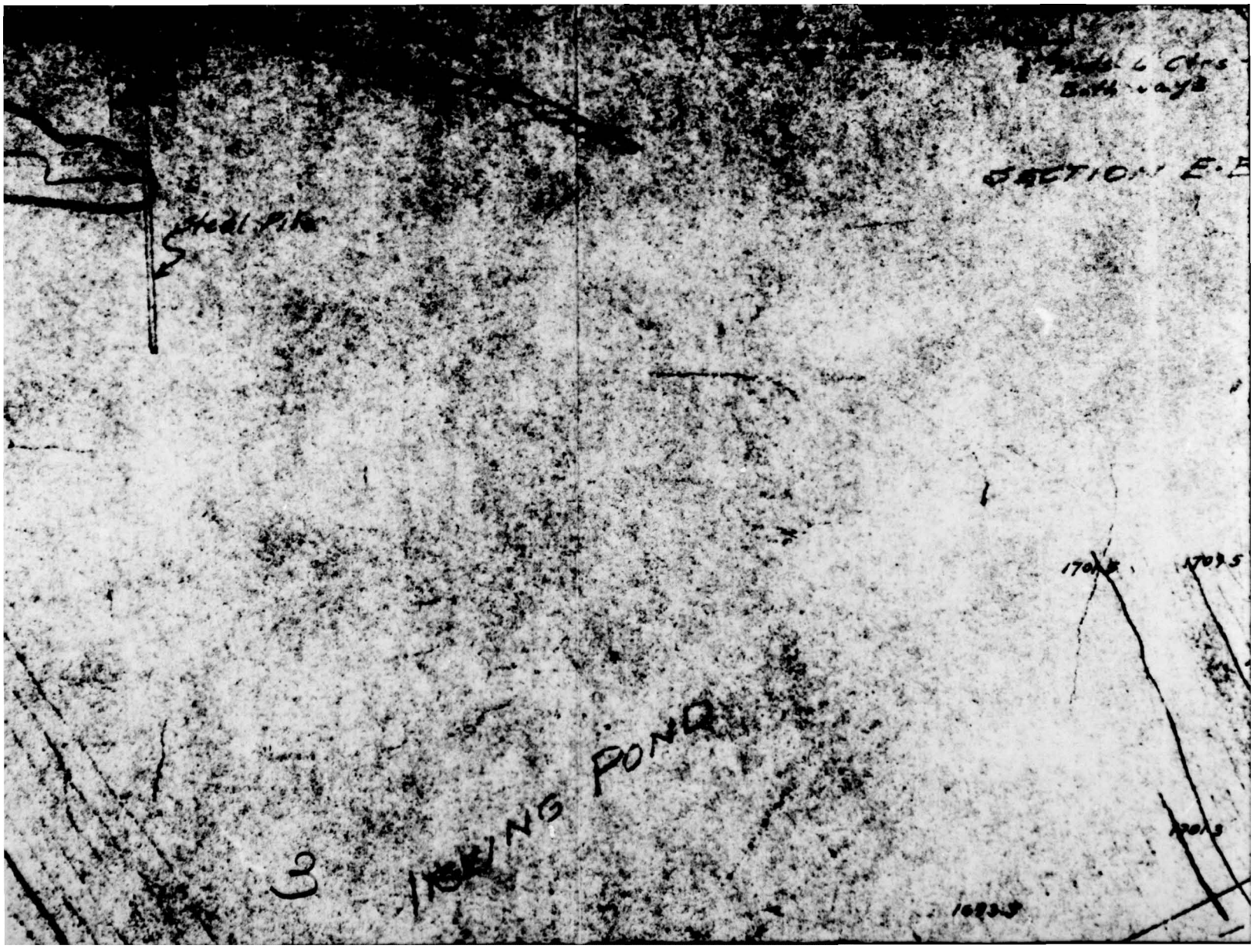
DRAWN	TRACED	CHECKED	INSPECTED	APPROVED
M.C.	M.C.	J.H.A.		
9/28/26	9/30/26	10/4/26		

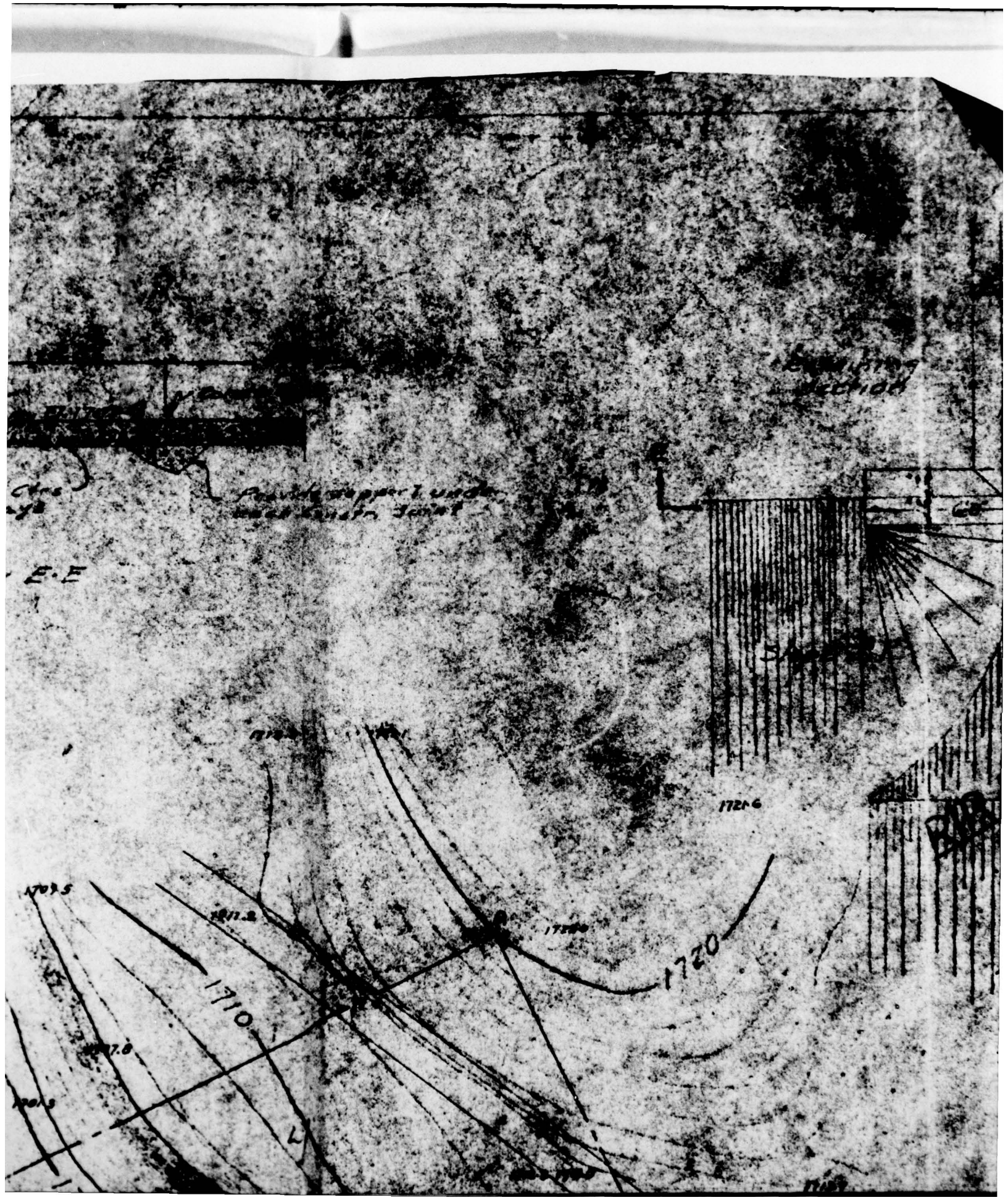
15

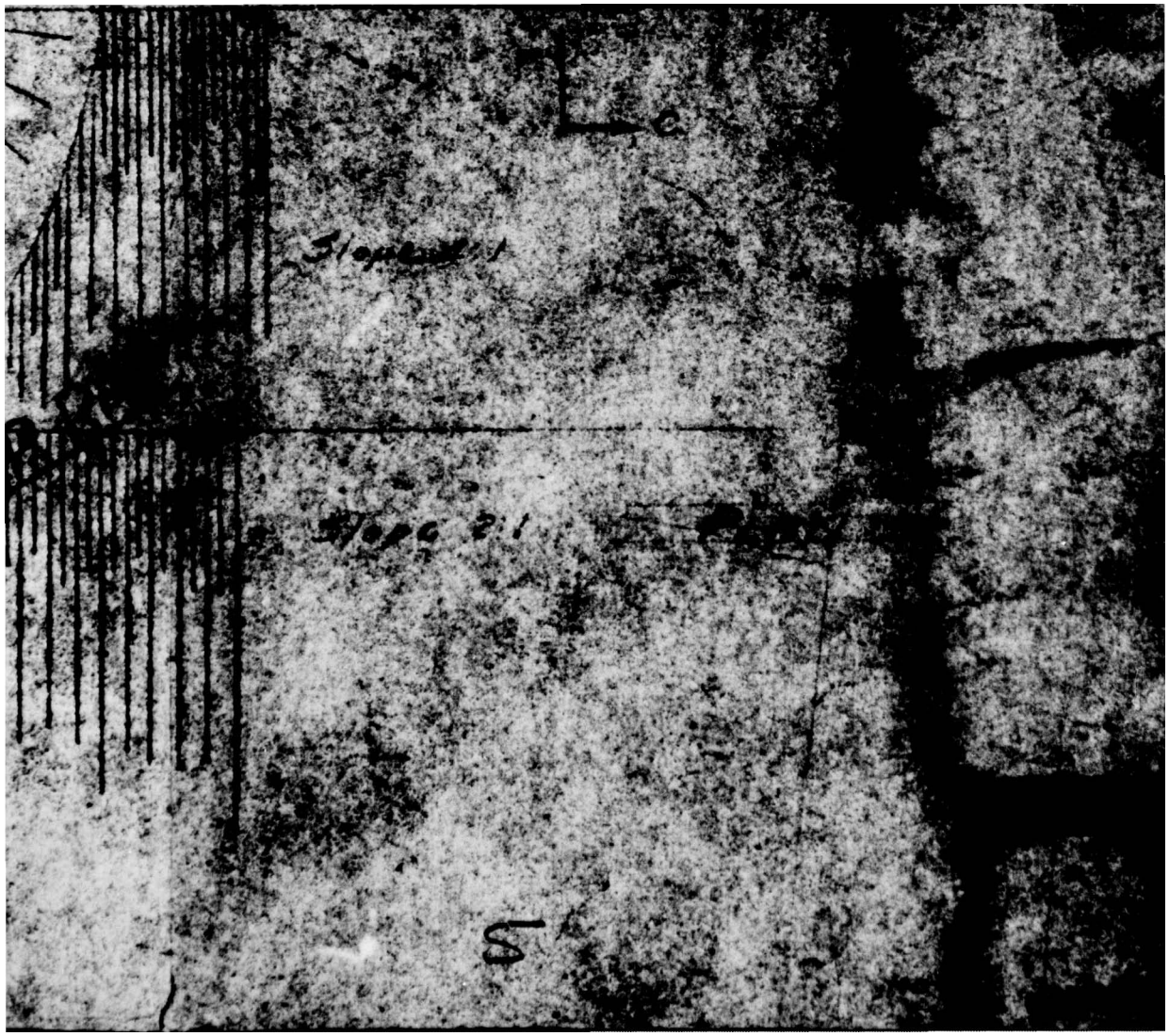
J-767

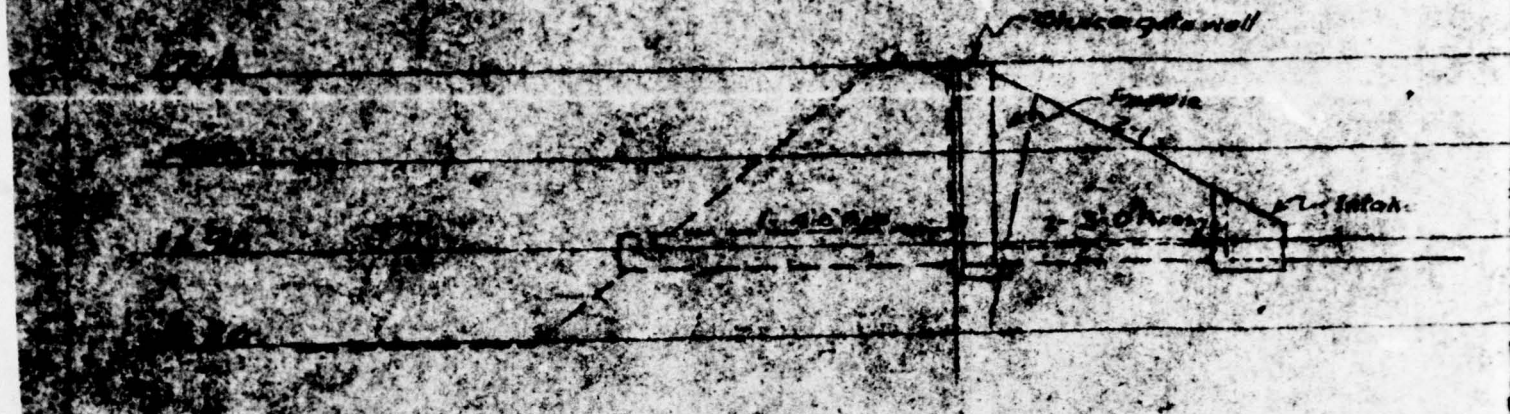



SECTION C-C
Scale 1"=10'
TRUE NORTH


Steel Pile
SECTION E-E
1701.5
1701.5
1699.5
1699.5
3
ING POND

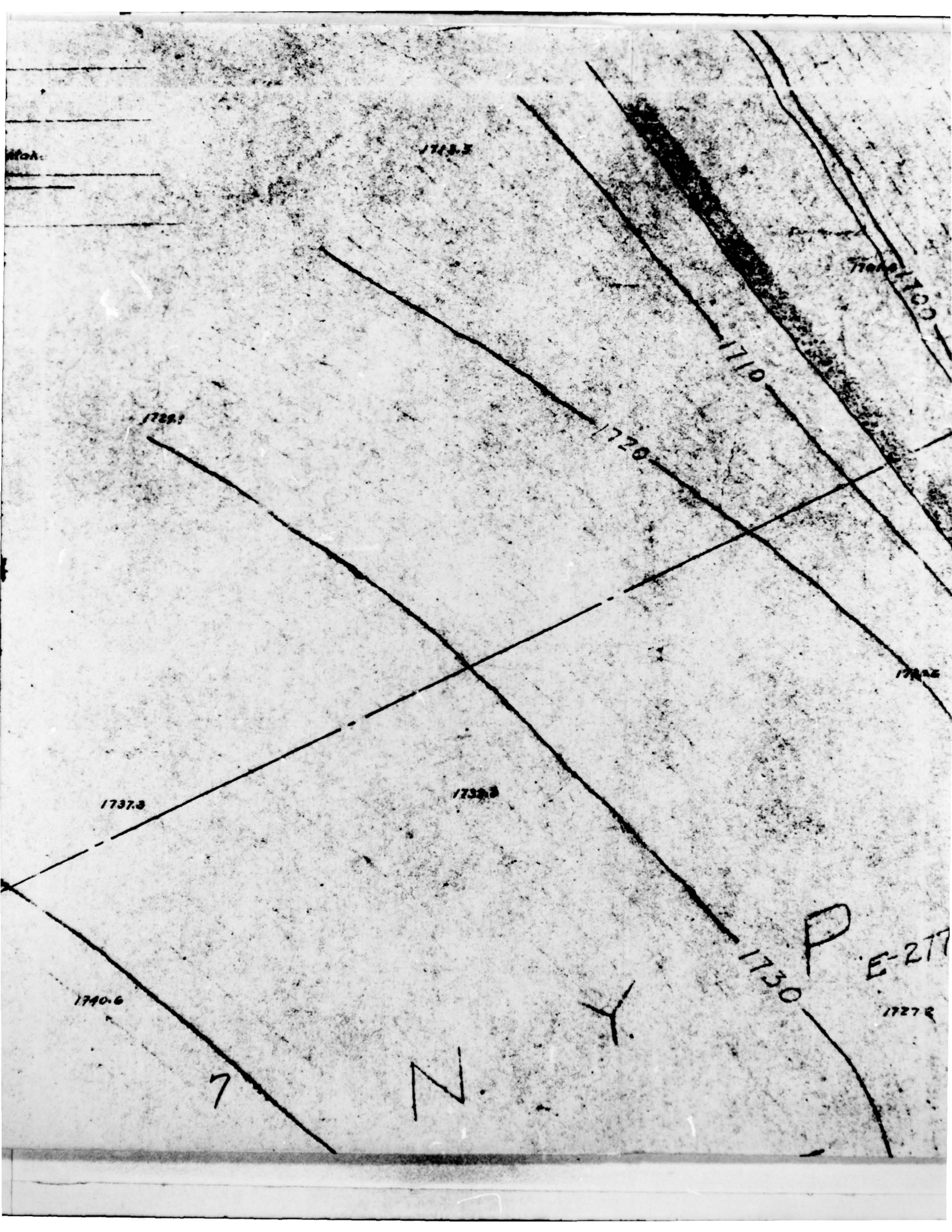

1720
1710

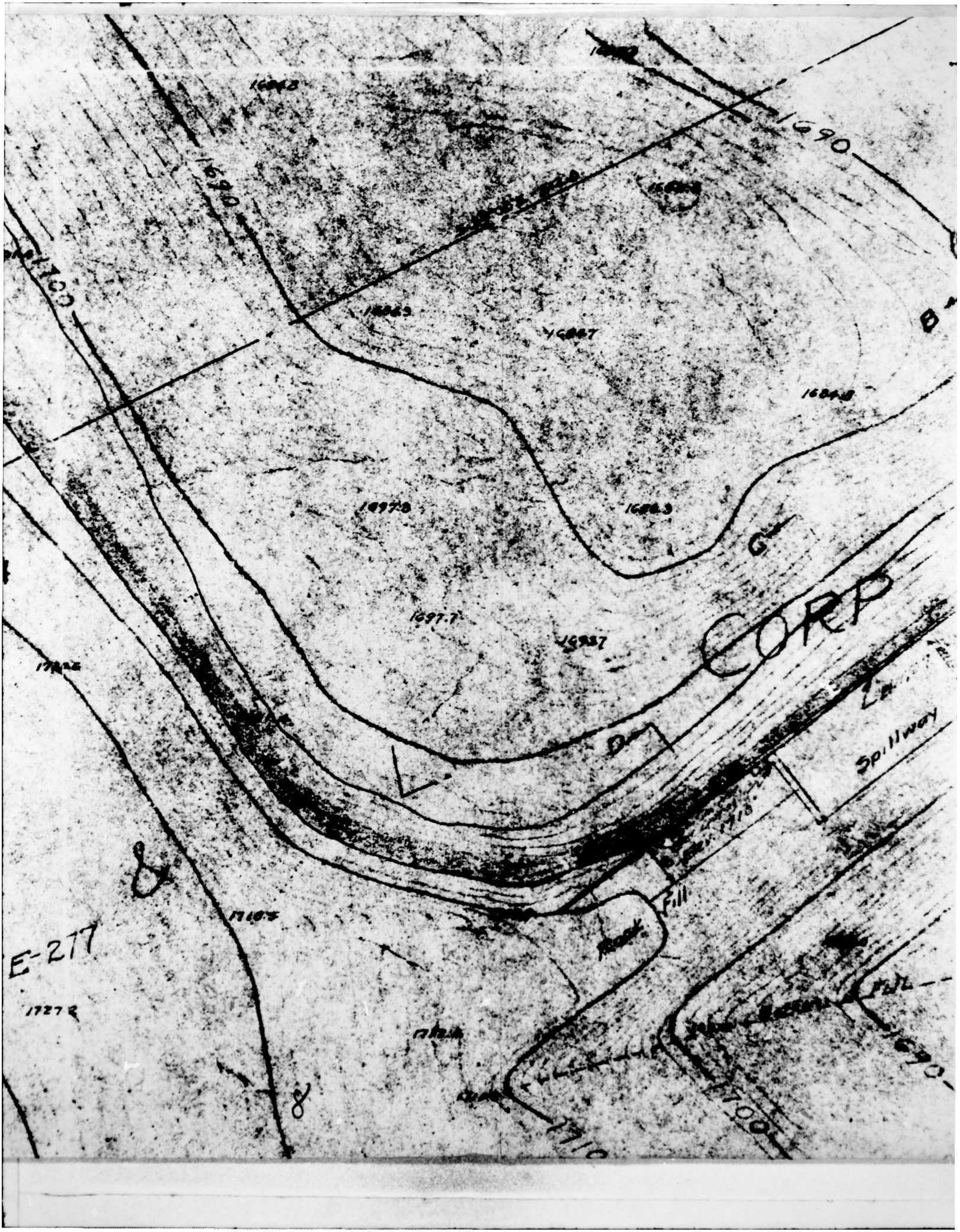


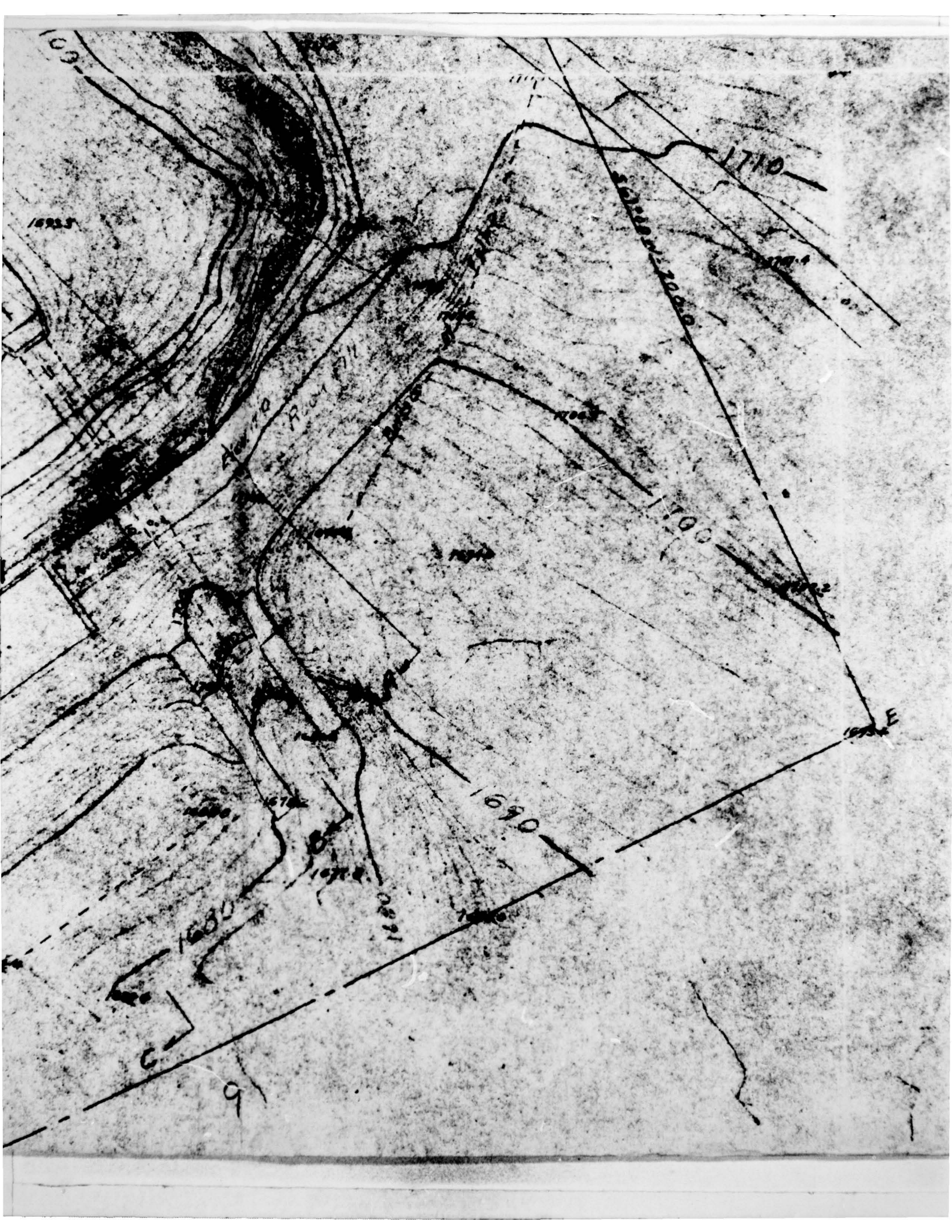


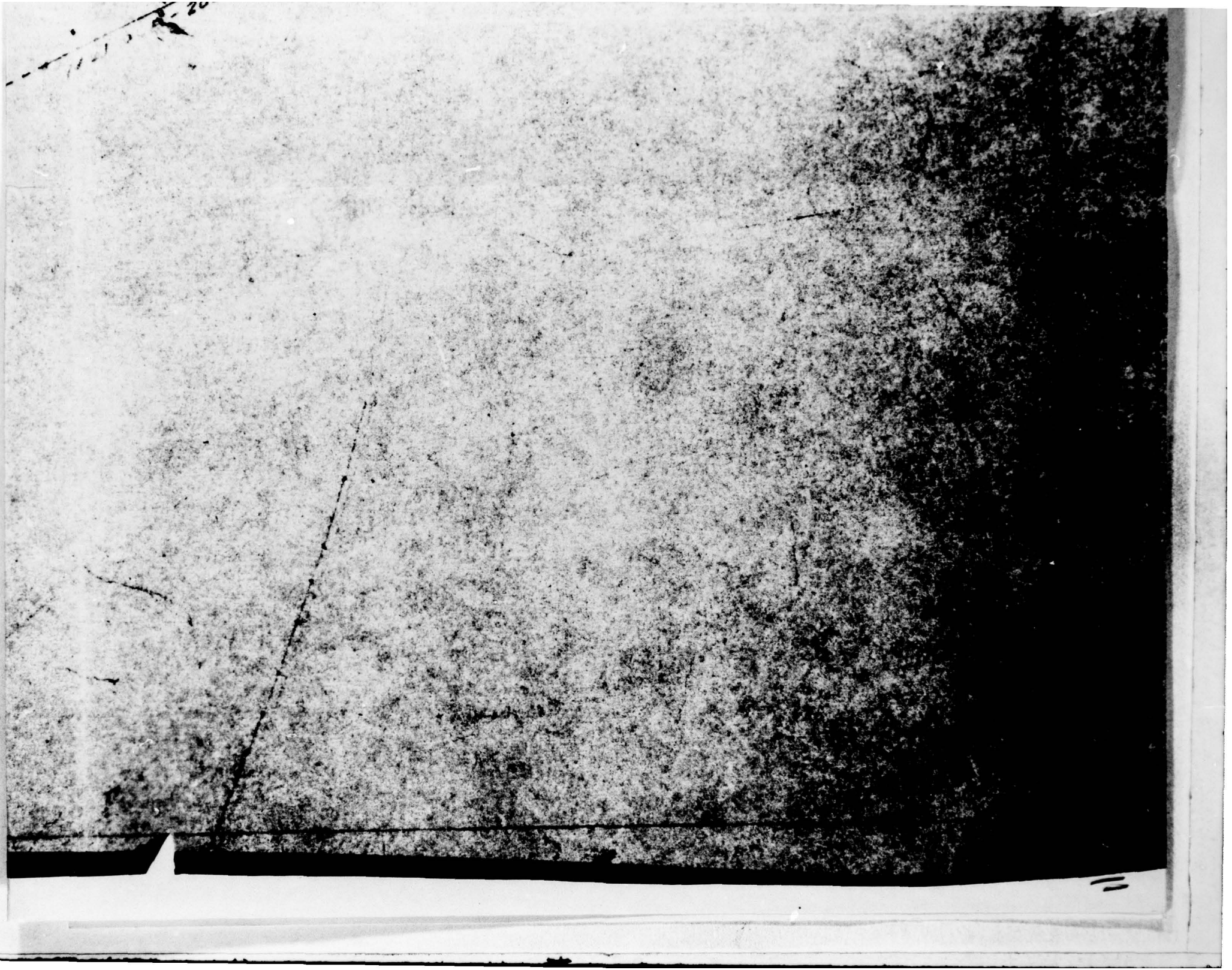
SECTION B-B

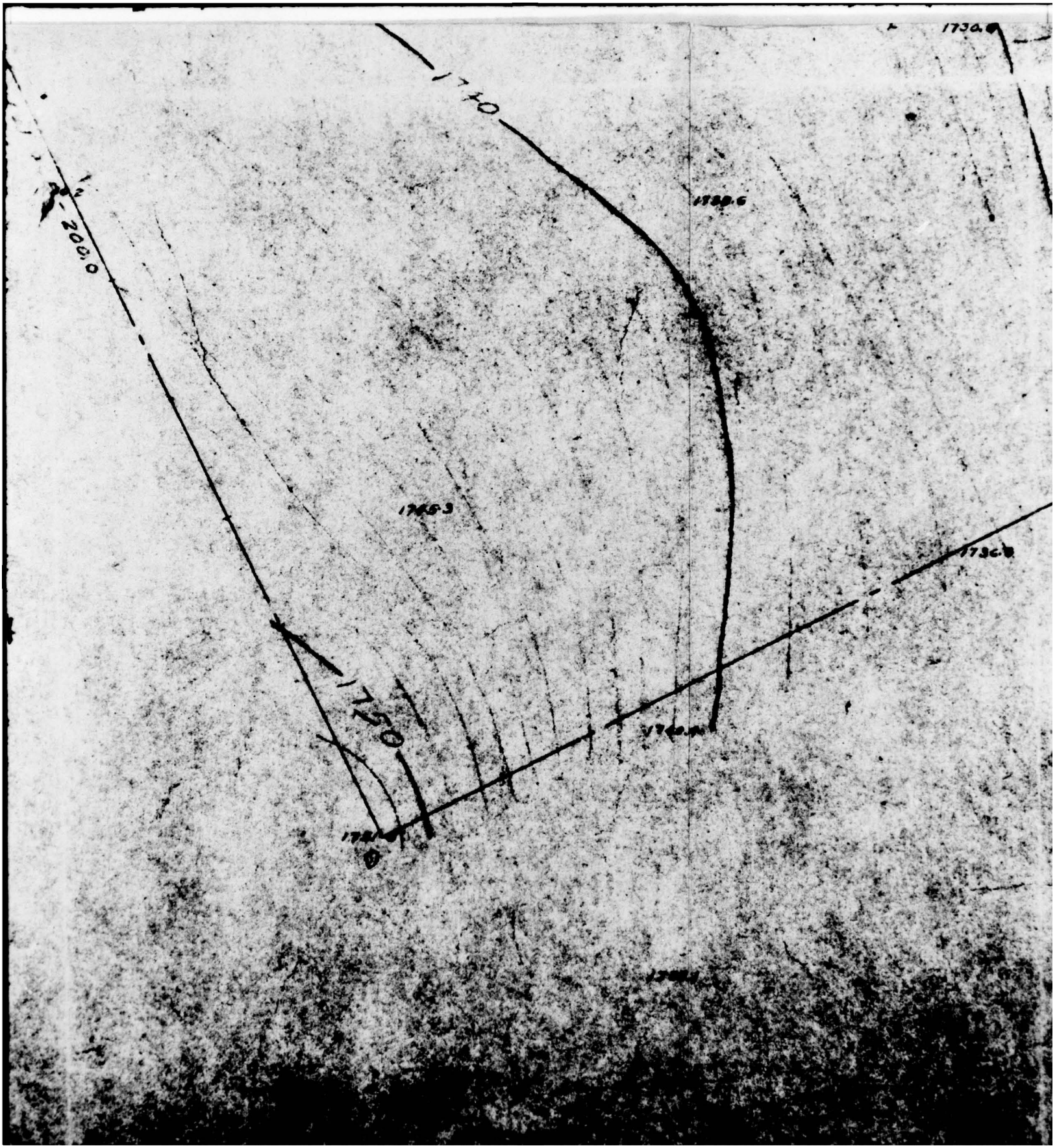
indicates existing grade
indicates propposed grade

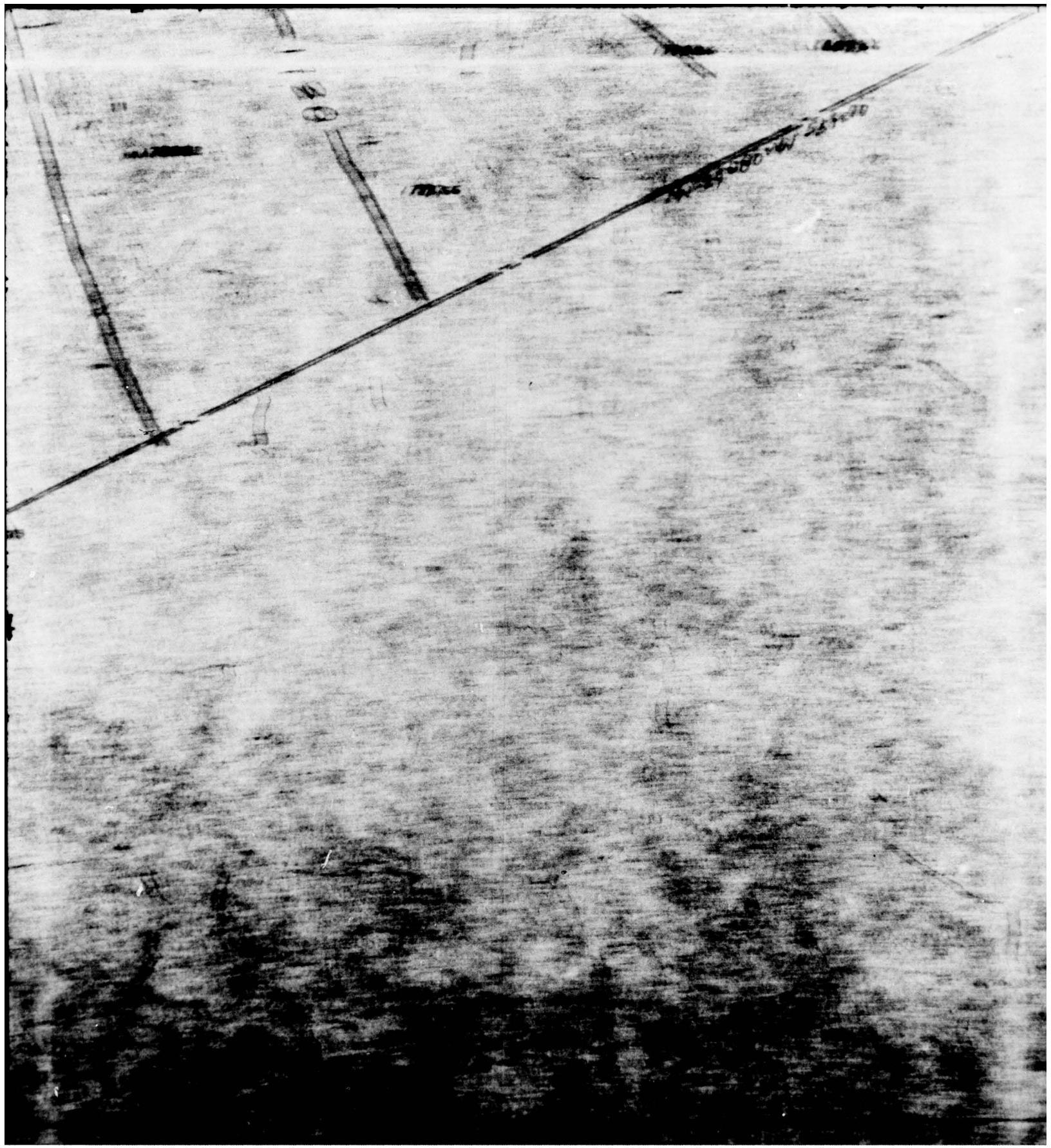

1710
1720
1730
1737.3
1740.6
P
E-27
N
Y
7


1690
1690
1690
1697.0
1697.7
CORPS
Spillway
Fill
Rock
E-277
1727.8
1710
1700
1690


1710
1700
1690
1680
E
C




1730.0
1740
1739.6
200.0
1765.3
1730.0
1720
1720.0



REFERENCE DRAWINGS.

H2340 - Sluiceway Details

Ludlow Valve Mfg Co Dwgs:-

#446 - Geared Floor Stand

#407-48 Sluice Gate

Notes:

C.M. (X) on ... at point P: ECH = 1720.0'

Superstructs Drawings 3-167, 5794 and H420 (in part)

IRVING POND